DECEMBER 1960

Traffic Safety

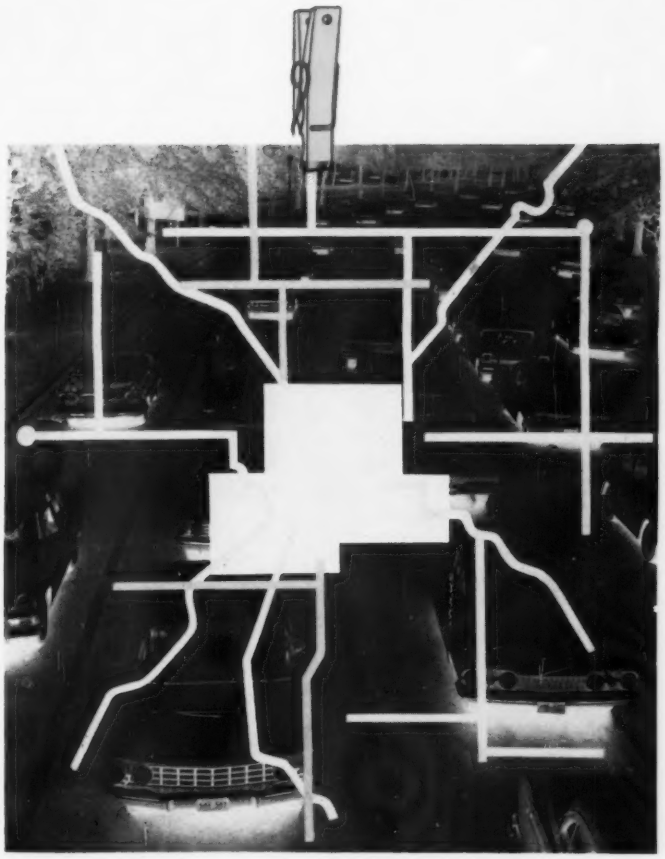
A NATIONAL SAFETY COUNCIL PUBLICATION

The Soldier As a Driver

See Research Review

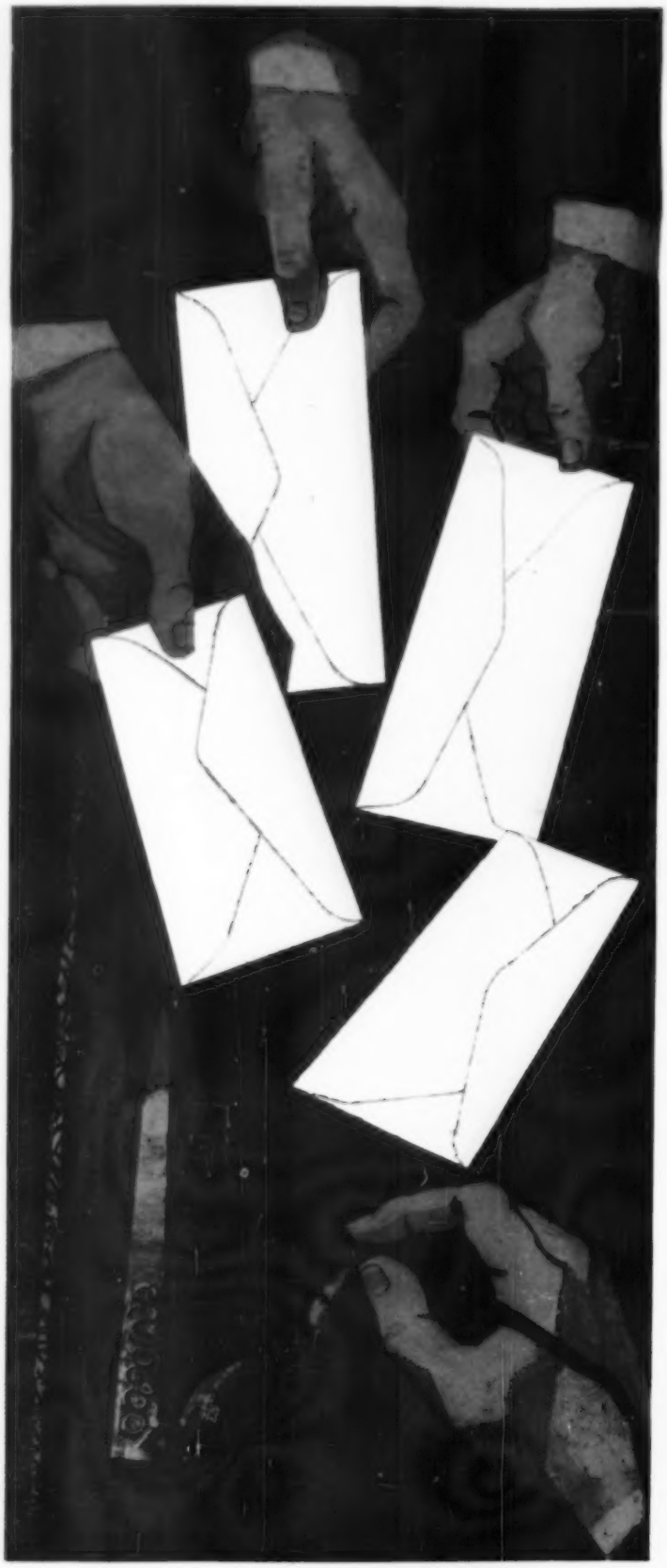
X-RAY ON TRAFFIC

How the Inventory Diagnoses Traffic Troubles



Also in this issue:

HOLIDAY HOSPITALITY—TEXAS STYLE



How to be sure you make the right choice after the Rock Salt bids are in

FIRST consider the company behind the product. What is its reputation, who does it serve, what are its resources? In terms of reputation, service and resources, the Morton Salt Company is the leader in the industrial salt field. Morton's outstanding reputation has been built on years of service to industries and municipalities throughout the United States. Now Morton, America's only nationwide salt company, can offer SAFE-T-SALT (rock salt) for ice control to users everywhere in the country from conveniently located salt sources and warehouses. And Morton numbers among its SAFE-T-SALT customers hundreds of towns and cities and many of the nation's counties, states and toll roads.

NEXT satisfy yourself that the bidder can keep his promise. Make sure he can deliver SAFE-T-SALT from a source near you, the fastest and most economical way. To better serve rock salt customers in the East and Midwest, Morton recently opened a giant new rock salt mine strategically located at Fairport, Ohio. The storage, loading and transportation facilities at the Fairport Mine, like the facilities at other Morton sources, insure you prompt delivery on whatever quantity of SAFE-T-SALT you order.

NOW make your purchasing decision. Base it on your evaluation of the company, its record and its ability to serve you. When you decide on Morton you can rest assured that you have made the wisest choice. You can depend on Morton to give you dependable prompt service on the SAFE-T-SALT you need, when you need it.

MORTON SALT COMPANY

INDUSTRIAL DIVISION

110 No. Wacker Drive, Chicago 6, Illinois

Circle Item No. 1—Reader Service Card

Stretching the long arm of the law in Milwaukee

Milwaukee, Wisconsin — This metropolitan area of over a million is justly proud of its traffic safety record and its police department. In 1959, the city had the lowest fatality record ever achieved by a community over 250,000. Service and maneuverability of its 80 Solos and 37 Servi-Cars are cited as important factors in Milwaukee's effective traffic control program.

OPENING DAY FOR THE BRAVES — It takes only an hour and a half to park approximately 10,000 cars at Milwaukee's County Stadium when officers mounted on Harley-Davidson Solos and Servi-Cars are on the job.

The force that made Milwaukee famous...

moves on Harley-Davidson Servi-Cars and Solos

Mobility is the key to successful law enforcement! Harley-Davidson police motorcycles supply this maneuverability when only minutes count. They stretch the arm of the law to reach any part of the community quickly whether the trouble spot is traffic, crime, fire or other emergency.

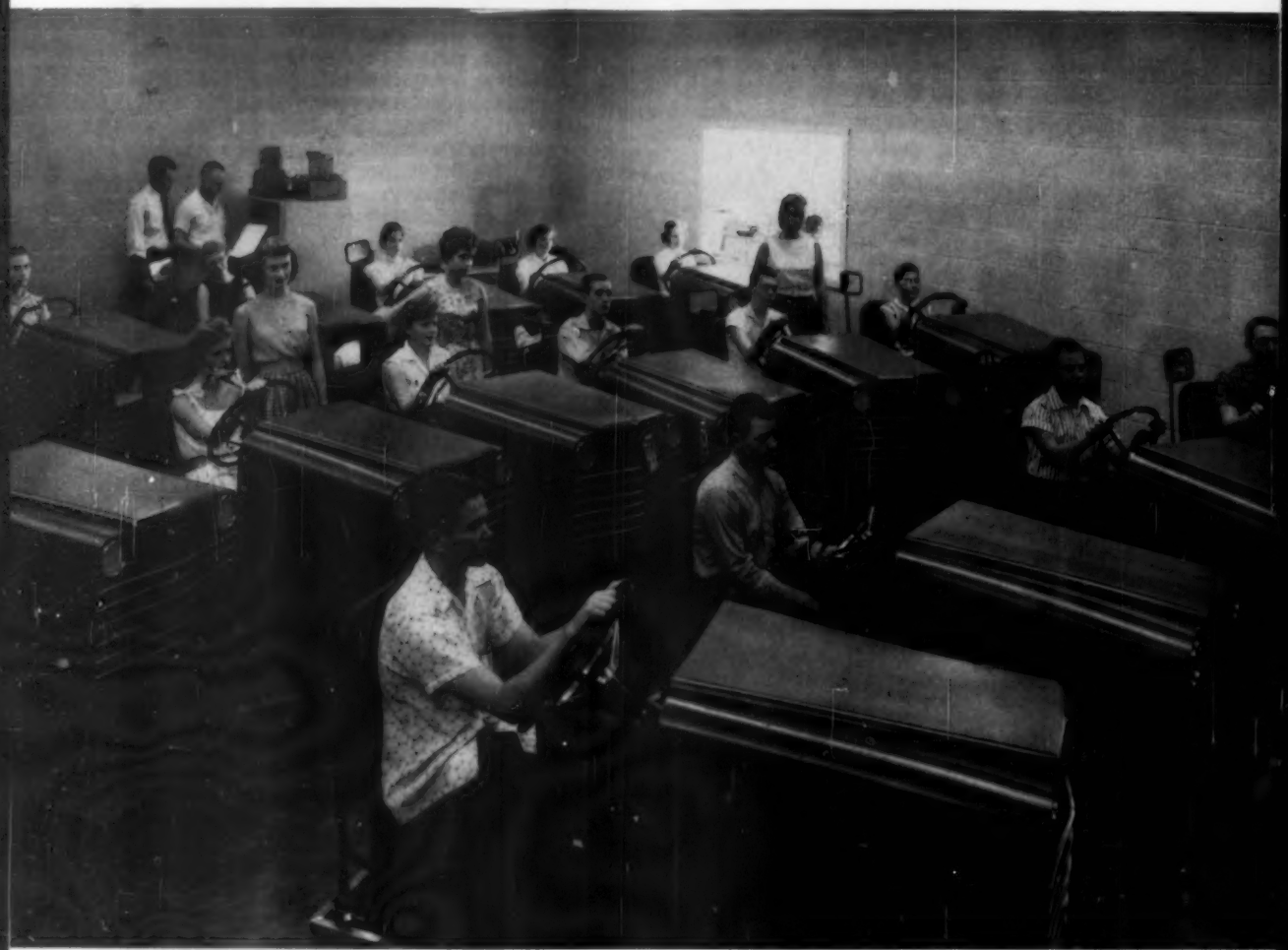
Harley-Davidsons *balance* your effectiveness: *Solos* are the ideal pursuit vehicle. Nothing stops these maneuverable two-wheelers from arriving on the scene of trouble . . . fast. Busy *Servi-Cars* are triple-threats for traffic control . . . parking and meter work . . . residential patrolling. Call your Harley-Davidson dealer, or write Harley-Davidson Motor Co., Milwaukee 1, Wisconsin, for free folder on effective police mobility — the Harley-Davidson way.

HARLEY-DAVIDSON

Police Motorcycles

Circle Item No. 2—Reader Service Card

DRIVOTRAINER—MODERN WAY



ON THE HIGHWAY IN THE CLASSROOM—Stationary cars, a series of special training films and an automatic score recording unit are basic components of the Drivotrainer classroom system. By multiplying the number of students that can be taught by one instructor, Drivotrainer permits more efficient use of teaching time available.

A LIFETIME OF DRIVING EXPERIENCE is duplicated by the film series used. Photographed from a moving car, films project on the screen what student would see through his own windshield. Students can be drilled in a full range of highway emergency situations until a satisfactory level of proficiency is achieved.

TO BETTER DRIVER EDUCATION

Helps teach more students faster, at lower costs

Faced with the need to provide effective driver education and training to an increasing number of students, high schools across the country are utilizing the Aetna Drivotrainer system of classroom instruction. With the Drivotrainer, an electro-mechanical teaching aid, one teacher can instruct as many as twenty-four students at the same time. Because students can "drive" through all kinds of situations *before* actually going on the road, safe driving skills, proper attitudes and sound judgment can be developed without any risk to life or property. Used to supplement behind-the-wheel instruction and experience, Drivotrainer offers these important advantages:

Better educational value—students are exposed to a wide range of learning situations, can be conditioned to react quickly and correctly to emergencies—the real test of driving ability.

Saves teaching time—hours needed for on-the-road instruction in dual-control car can be cut in half, still meet required standards.

Cuts costs per pupil—training more students in less time, *without* increasing the teaching staff, results in measurable economy.

The Drivotrainer system was originally developed as a public service by the Aetna Casualty and Surety Company through extensive work with a panel of nationally known educators. To carry this program forward, Rockwell Manufacturing Company is now producing and distributing the Drivotrainer for use in schools as well as for application in the re-training of experienced drivers. For further information on the Drivotrainer installation best suited to *your* needs, write: Rockwell Manufacturing Co., Drivotrainer Division, 407M N. Lexington Ave., Pittsburgh 8, Pa.

FULLY EQUIPPED with all essential instruments and controls, cars can be used for teaching both conventional and automatic shifting, simulate motor noise and brake pedal "Feel" for added realism.

AUTOMATIC SCORING SYSTEM records student actions on master sheet, enabling instructor to follow individual performance as well as indicating level of class progress.

DRIVOTRAINER

another fine product by

ROCKWELL

Circle Item No. 3—Reader Service Card

THE SAFETY LIBRARY

(Monthly supplement to *Guide to Traffic Safety Literature*. Guide is available from NSC.)

by Lois Zearing, Librarian, NSC

Accidents

Cook County Reports on Expressway Accident Pattern. *Street Engineering*. September, 1960. p. 32-34.

Expressways Slash Costs, AAA Clubs Report. *American Motorist*. September, 1960. p. 10.

Highway Accident Studies, 1960. pp. 1-56. (Presented at the 38th Annual Meeting January 5-9, 1959.) Highway Research Board, National Academy of Sciences, 2101 Constitution Ave., N. W. Washington 25, D. C. (Bulletin 240) Price $1.00.

(Includes: Statistical Determination of Effect of Paved Shoulder Width on Traffic Frequency by R. C. Blensly and J. A. Head; Factor Analysis of Roadway and Accident Data by John Versace; Accident Analysis of an Urban Expressway System by A. F. Malo and H. S. Mika; Interchange Accident Exposure by S. M. Breuning and A. J. Bone; Inventory Speed Responses and Prior Traffic Records as Predictors of Subsequent Traffic Records. Harry W. Case and Roger G. Stewart.)

New Jersey Traffic Accident Facts, 1960 edition. 20pp. Department of Law and Public Safety Division of Motor Vehicles, Bureau of Traffic Safety, Trenton 25, N. J.

Road Transport Accidents in Industry. V. A. Broadhurst. *The British Journal of Industrial Safety*. Summer 1960. No. 52. p. 22-25.

(A study of causes and types of accidents to road vehicles on factory premises.)

Statistics of Road Traffic Accidents in Europe, 1958-1960. 53 pp. Economic Commission for Europe. United Nations Publication. Sales Number 60. II E/Mim. 8. Available from International Documents Service, Columbia University Press, 2960 Broadway, New York 7, N. Y. Price 50 cents.

Traffic Accidents Scrutinized by the Pennsylvania Department of Health, C. L. Wilbar. *American Journal of Public Health*. September, 1960. p. 1349-1354. (Progress made by the Pennsylvania Department of Health on what seemed to be its obligations in the field of public health endeavor in preventing traffic accidents.)

Virginia Crash Facts, 1959. 36 pp. Department of State Police, Richmond, Va.

Belts

Auto Seat Belts? Government Safety Engineers and Research Experts say: "Yes," *Safety Standards*. September-October, 1960. p. 1-4.

Everybody's Weapon: Fasten Your Seat Belts. Part Three. Hal Higdon. *The Kiwanis Magazine*. September, 1960. p. 36-38, 51-52.

Seat Belt Specifications and Installation Standards Aid to Federal Agencies. *Safety Standards*. September-October, 1960. p. 5-6.

Drivers and Driving

Initial Plans for Federal Register Announced. *A.A.M.V.A. Bulletin*. August, 1960. p. 3-4.

(Full text of a statement issued by the U. S. Department of Commerce on August 15, relative to the establishment of a federal register of persons whose driver licenses have been revoked following convictions for certain offenses.)

International Driver Licenses. J. Stannard Baker. *Traffic Digest and Review*. September, 1960. p. 12-13, 30.

(There is a need for developing licensing systems that will permit the freest possible world-wide travel which will also make for an exchange of accident data.)

The Marks of a Good Driver, Louis C. Lundstrom. *American Youth*. September-October, 1960. p. 6-8.

(Directed to youths who drive to and from schools.)

Mobile Driver Training Classroom. *Traffic Digest and Review*. September 1960. p. 20-21.

(Jefferson County, Colo., school district converts army bus into classroom for driver education which has enabled small rural high schools to share simulators.)

Our Failure to Apply Psychology to the Field of Driver Safety. Charles T. Perin, Jr. *Traffic Digest and Review*. September, 1960. p. 23-26.

(The author expresses his fears that our failure to make the most of the scientific knowledge and theory available is costing us daily suffering and loss of life.)

Proneness of Drivers to Road Accidents, R. J. Smeed. *Nature*. April 23, 1960. p. 273-275.

(A scientific investigation of causes of road accidents from the physiological or psychological traits of drivers who are more prone to accidents.)

Ridding the Roads of the Murderous 4 per cent. Ernest Hunter Wright. *Harpers Magazine*. July, 1960. p. 61-63.

(The author gives 10 points that cause accidents and suggests what to do to stop these errors.)

Survey of State Requirements for Motor Vehicle Operators. 1960. 4pp. American Optical Co., Southbridge, Mass.

Vermont Regulates Commercial Driving Schools. *A.A.M.Y.A. Bulletin*. August, 1960. p. 6-7.

What Makes Us Such Good Drivers?* *9 Out of 10. 1960. 18pp. Ford Motor Co., Box 123, Dearborn, Michigan. Price 25c.

(An illustrated booklet for testing yourself as to whether you are an average driver. This is based on the research study conducted by Opinion Research Corp. for The Pure Oil and the ATA Foundation of the American trucking industry.)

Enforcement

"Conspicuous Patrol" Slows Speeds, Curbs Violations . . . But . . . *Chicago Traffic Safety Review*. August, 1960. p. 1-2, 4.

Driver License Point Systems. Second of Two Parts. Robert L. Donigan and Edward C. Fisher. *Traffic Digest and Review*. September, 1960. p. 33-40.

(The courts' approach with case illustrations.)

Oregon Adopts the Uniform Citation. Philip Michael Bagley. *Traffic Digest and Review*. September, 1960. p. 10-11, 28-29.

(The author describes the various steps by which the citation was put into effect in Portland and then throughout the state.)

Traffic Violations Multiply When Squad Car Is Not in View. *Chicago Traffic Safety Review*. August, 1960. p. 3.

Exhaust Gas

Air Pollution from Automobile Exhaust. W. L. Faith. *Journal of Occupational Medicine*. September, 1960. p. 439-441.

Inspection

Vancouver Accidents Cut by Inspections. Robert J. Frith. *Automotive News*. September 19, 1960. p. 30.

(Motor vehicle inspection station has reduced traffic accidents due to mechanical failure from 36 per cent to about 1 per cent.

Lighting

An Informational Guide for Lighting Controlled Access Highways. Committee on Planning and Design Policies. 1960. 14pp. American Association of State Highway Officials, 917 National Press Building, Washington 4, D. C. Price 25 cents.

High-Intensity Guide Lights for Curved Underpass. Harold F. Wall. *Street Engineering*. September, 1960. p. 14-15.

(The lighting for Detroit's Cobo Hall underpass provides a high level of illumination without glare and a versatile system that meets changing lighting requirements 24 hours a day.)

Motor Vehicles

Motor Truck Facts. 1960 edition. 56pp. Automobile Manufacturers Association, Inc., New Center Building, Detroit 2, Mich.

Pavement Markings

Center and Edge Stripe Painted in Single Run. *Roads and Streets*. September, 1960. p. 137.

Two-Tone Channelizing Solution. William R. Carrow. *Roads and Streets*. September, 1960. p. 93-94.

Skidding

Instructions for Using the Portable Skid-

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Traffic Safety

Volume 57 Number 6 December 1960

A NATIONAL SAFETY COUNCIL PUBLICATION

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TRAFFIC SAFETY is dedicated to the prevention of traffic accidents through the presentation of objective information and responsible opinion to official agencies, public support groups and the motor transportation industry. The views expressed do not necessarily reflect the beliefs or policies of the National Safety Council, but they are presented in the conviction that the pressing social problem of traffic accidents can best be resolved through freedom of expression and open debate.

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BETWEEN STOPS

TV personality, automobile collector, sports car fan, safe driver—that's Dave Garroway, star of NBC-TV's *Today*.

He not only has seat belts in his cars, but he uses them. And he insists that people riding with him use them also.

He worked out a foolproof scheme to make sure his passengers fasten their belts also.

The seat belts in his cars are wired for sound. After the ignition is turned on, the car horn blows continuously until all seat belts in the car are fastened.

Thus, passengers have a choice between fastening the belts properly or sitting on them. The latter is uncomfortable—as well as stupid—and a few seconds of blaring horn is usually enough to convince the most reluctant passenger to fasten his seat belt.

It's one way to make a big noise about safety.

Toll Rises In September

by H. Gene Miller

MOTOR vehicle deaths in September totalled 3,430, a 2 per cent rise over September of the previous year. This marked the fifth month in the last six that deaths increased over the corresponding month of the previous year.

Although there have been six months in the past nine in which deaths were higher than the same month of the previous year, the first nine months of 1960 were only 1 per cent over the total for the same months of 1959. This was due mainly to a large decrease of 16 per cent experienced in March, which greatly offset the effect of generally smaller increases. The 1960 total of 27,440 compares with 27,220 in the previous year.

Motor vehicle travel is still running nearly 2 per cent ahead of 1959. This increase which exceeds slightly the increase in deaths, produced a death rate for nine months of 5.1 (deaths per 100 million vehicle miles). This is the lowest nine month mileage death rate on record and compares with 5.2 for the same months of 1959.

H. Gene Miller is director of the National Safety Council's research and statistics department.

Traffic Summary

September	1960	1959	Change
Deaths	3,430	3,360	+2%
Nine Months			
Deaths	27,440	27,220	+1%
Mileage (billions)..	533	523	+2%
Death Rate..	5.1	5.2	—2%

Disabling injuries during the first nine months of the year are estimated at about one million. These are injuries resulting in disability beyond the day of the accident and do not include minor injuries which undoubtedly total many millions more.

Of the 48 states reporting to the Council, 18 had fewer deaths in September than in September a year ago, one reported no change, and 29 had increases.

For nine months, 23 states showed decreases and 25 had increases.

In contrast to the national experience, cities recorded a 2 per cent decrease in September, according to reports from 720 cities of more than 10,000 population. For nine months, these cities showed a 3 per cent increase over last year.

In September, 149 cities had fewer deaths than a year ago, while 122 reported more deaths and 449 showed no change.

For nine months, 254 cities had decreases, 305 had increases, and 161 showed no change.

A total of 537 of the 720 reporting cities had perfect records in September. The three largest were Dayton, Ohio (300,700), Norfolk, Va. (291,000), and Spokane, Wash. (188,500).

At the end of nine months, 170 cities still had perfect records. The three largest were Schenectady, N. Y. (98,000), Lexington, Ky. (66,900), and San Mateo, Calif. (66,000).

The leading cities in each population group at the end of nine months,

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Leading at the End of September

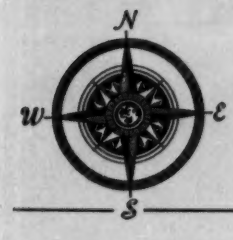
States

Rhode Island	—32%	Montana	— 7%		
New Hampshire	—32%	Illinois	— 6%		
Nebraska	—21%	Texas	— 6%		
Kansas	—19%	Arkansas	— 4%		
West Virginia	—17%	Wyoming	— 4%		
Virginia	—14%	Arizona	— 3%		
New Mexico	—14%	North Carolina	— 1%		
Iowa	—13%	Maryland	— 1%		
North Dakota	—12%	Kentucky	— 1%		
New York	—11%	Oklahoma	— 1%		
Oregon	— 9%	Indiana	— *%		
Nevada	— 9%				

Cities

Grand Rapids, Mich.	—46%	Seattle, Wash.	—26%
Oakland, Calif.	—41%	Akron, Ohio	—26%
Worcester, Mass.	—41%	Atlanta, Ga.	—24%
Omaha, Neb.	—39%	New York, N. Y.	—18%
Miami, Fla.	—39%	Honolulu, Hawaii	—15%
Houston, Tex.	—30%	Chicago, Ill.	—13%
Boston, Mass.	—29%	San Diego, Calif.	—11%
El Paso, Tex.	—29%	St. Louis, Mo.	— 7%
Birmingham, Ala.	—27%	San Francisco, Calif.	— 5%

*Less than .5%



Today's Traffic

He likes seat belts

Gerald Frank, vice president of a Chicago lithographing company, is really sold on seat belts. Before taking off on a trip to New England and Quebec in a rental car, Frank insisted on having seat belts installed for his wife and himself. It took some persuasion — plus a cash outlay of $18.75. But Frank claims it's the cheapest insurance policy he has bought in years.

"Parketts" out in Morgantown

A court decision in Morgantown, W. Va. prohibits the city from using non-police personnel to patrol parking meters. The ruling settled a dispute between the police department and the city that had started when the city employed a woman "Parkette" to check meters. The police charged that the woman was performing duties in violation of state and local civil service regulations. The judge agreed.

They mean business

Germany and Austria are cracking down on drinking drivers. By the end of this year, a German motorist who has had two double whiskies or four pints of beer will be considered drunk in the eyes of the law. Offenders will be fined on the spot and sentenced. Tavern owners are now sentenced for serving drinking drivers who later become involved in fatal accidents.

Cars for driver ed.

A record high total of 13,805 practice driving cars were provided by the nation's new car dealers for use in high school driver education courses during the 1959-60 school year. Of the total provided, 8,415 cars, valued at more than $21.5 million, were loaned to schools free of charge.

Somebody goofed

Two members of the Casper (Wyo.) PTA received traffic tickets on the way home from a panel discussion for junior high school students. The subject of the discussion was safe driving.

Too successful

Local police in Nimes, France, erected a wooden gendarme in full uniform to cut road accidents at a high accident location. Several weeks passed with no accidents reported. But police headquarters at Marseilles, figuring that it would be embarrassing if wooden policemen proved too effective, ordered the extra "man" removed.

More than 1,500 safety people packed the Grand Ballroom of the Conrad Hilton Hotel at the Annual Congress Banquet.

CONGRESS CANDIDS

Howard Pyle, president of the National Safety Council, presented first Trustees Award to representatives of winning city and state. In the picture at left he is shown with Mayor James Gilmore of Kalamazoo, Mich. — at right with Gov. Robert Meyner of New Jersey and Lloyd M. Felmly, president, New Jersey State Safety Council.

The Traffic Education and Training Committee discussed ways of expanding educational opportunities for people already in the traffic field and of encouraging young people to choose careers in traffic.

Walter K. Koch, vice president for state and local safety organizations, urged action at the local level.

Banquet guests waited turns to compliment Gen. Alfred M. Gruenther on thought-provoking speech. That's William H. Lowe, newly elected chairman of NSC board of directors, smiling in background.

In huddle at meeting of Committee on Uniform Traffic Accident statistics were (left to right) Robert P. Shumate, IACP, committee chairman; David Solomon, BPR, and Elbert Hugunin, NSC, committee secretary.

Maj. Gen. G. C. Stewart, executive vice president of National Safety Council, presented annual report.

Carol Lane Award winners (left to right) Mrs. Victor W. Haflich, Garden City, Kan.; Mrs. Irvin Clark, Toledo, and Miss Beulah Bennett, Poplar Bluff, Mo., received their trophies from Carol Lane at Gala luncheon.

NEWS FROM CAPITOL HILL

WASHINGTON has a way of holding its breath, and much of its normal activities, during the quadrennial period of presidential campaigning. This situation affects safety matters, along with others.

Traffic Safety

The Chairman of the House Committee on Interstate and Foreign Commerce, in summarizing the major legislative activities of his committee during the last Congress, cited the license registration bill "as a further indication of the committee's continuing interest in traffic safety."

Motor-vehicle registrations are expected to reach 73,868,000 for 1960, according to the Federal Highway Administrator. The 1960 estimate will represent a gain of 3.3 per cent over 1959. Of the anticipated total, passenger cars are expected to reach 61,569,000, a 3.4 per cent increase over 1959, and trucks and buses are expected to number 12,299,000, a gain of 3.0 per cent. Ten states account for 54 per cent of the total registrations.

The Federal Safety Council recommended the installation of seat belts in all government-owned vehicles "except those vehicles where the use of this safety device is clearly impracticable or inadvisable for demonstrable reasons." In reporting this action, the publication of the Bureau of Labor's Statistics states: "Acting voluntarily and collectively, federal agencies could give lagging public interest (in the use of seat belts) a shot in the arm —at the same time improving their own injury rates." At the present time, no uniform federal government-wide policy exists on the use of safety belts.

The U. S. Commissioner of Foods and Drugs issued a special report on efforts to curb the illegal sales of "pep pills" to truck drivers and motorists, and said that the bootlegging of such pills is "a menace to safety on the nation's highways." He added: "Driving fatigue and the misuse of amphetamine drugs add up to danger on our highways for innocent persons as well as drugged drivers. Medical and driving safety experts agree that a driver who uses amphetamines to stay awake beyond the limits of physical and mental endurance may swerve off the road because he sees a traffic hazard that isn't there, or into the path of an oncoming vehicle because he fails to see it." The federal official commented on "the weakness of the present federal law which is not well designed to cope with this type of violation." He indicated that consideration was being given to the submission of legislative proposals to the next Congress.

The District of Columbia adopted new regulations to curb air pollution by motor vehicles. After consideration, the district did not enact a proposal requiring installation of devices to deal with blowby or crankcase fumes. It did, however, promulgate on "excessive" vehicle emissions to the extent that such fumes may not be of such density as to obscure the background by 40 per cent or more, and prohibited engine idling by buses under certain conditions.

Commercial Transportation

As a part of motor carrier investigation, the Interstate Commerce Commission warned carriers to conduct prompt and thorough investigations of driver applicants before permitting them to operate vehicles in interstate commerce. The ICC stated: ". . . we do not consider any carrier to be excused from its obligation to insure that its drivers are qualified and its vehicles are safely operated by virtue of any obligation it has assumed in its contract with an employe union. In the area of safety of operation, the carrier's obligation to the public and its ability to abide by the provisions of the Interstate Commerce Act and our regulations thereunder must remain paramount." The ICC also addressed itself to the unions: "Unsafe operations present serious hazards to employes. Therefore, we urge employe organizations to join their efforts with those of management to achieve the maximum of safety in operation."

Accidents to Older Persons

The U. S. Public Health Service released its report on health statistics affecting older persons, as compiled in the National Health Survey conducted in the period from July 1957 to June 1959. The data show that about 3,353,000 people 65 years and older were injured annually. This constitutes a rate of 228.5 persons per 1,000 population. About two-thirds of such persons (or 2,293,000) were injured in accidents occurring in the home. (Injured as a result of motor vehicle: 865,000; injured while at work: 258,000). About 85 per cent of the bed-disability days reported were associated with fractures, dislocations, sprains, strains, contusions and superficial injuries.

Recommend Lower Alcohol Levels

The National Safety Council has passed a resolution designed to make it easier to rid the highways of drunken drivers.

The Council's Committee on Alcohol and Drugs, meeting at the 48th National Safety Congress, approved the following resolution:

"The committee urges the state legislatures, when amending or enacting chemical test laws, to establish the three blood-alcohol level zones at the following: Zone 1—0 to 0.05 per cent; Zone 2—0.05 to 0.10 per cent; Zone 3—0.10 and above."

Drivers in Zone 1 are presumed not to be affected; those in Zone 2 may be affected, but are not presumed to be; those in Zone 3 are presumed to be affected.

The resolution has the effect of recommending reduction of the point at which a driver can be charged with driving while under the influence from 0.15 per cent to 0.10 per cent.

The committee also referred to a subcommittee for further study a recommendation for a new offense—driver impairment — which could be established at the middle zone, 0.05 to 0.10 per cent.

Chairman of the committee on alcohol and drugs is James P. Economos, director of the traffic court program of the American Bar Association.

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For Homes

Dr. George M. Wheatley, third vice president, Metropolitan Life Insurance Co., New York, N. Y.

For Industry

Walter E. Montgomery, safety director, Quebec Asbestos Mining Association, Montreal.

For Labor

Lloyd D. Utter, director, industrial health and safety division, United Automobile Workers, Detroit.

For State and Local Safety Organizations

H. G. Mangelsdorf, Standard Oil Co. (N. J.), New York, N. Y.

For Membership

John L. Gillis, vice president, Monsanto Chemical Co., St. Louis.

Motor Transport

Mark Robeson, vice president, Yellow Transit Freight Lines, Inc., Kansas City, Mo.

For Production

Robert R. Burton, senior vice president, Kenyon & Eckhardt Inc., New York, N. Y.

For Public Information

Charles W. Ferguson, senior editor, *The Reader's Digest*, Pleasantville, N. Y.

For Research and Education

Dr. William P. Yant, director of research, Mine Safety Appliances Co., John T. Ryan Memorial Laboratory, Pittsburgh.

William H. Lowe

For Schools and Colleges

Dr. Lowell B. Fisher, chairman, North Central Association of Colleges and Secondary Schools, University of Illinois, Urbana.

For Traffic

Bertram D. Tallamy, federal highway administrator, Bureau of Public Roads, Washington 25, D. C.

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J. W. Bethea, executive secretary, President's Committee for Traffic Safety, Washington, D. C.

Russell I. Brown, president, Insurance Institute for Highway Safety, Washington, D. C.

J. E. Buchanan, president, The Asphalt Institute, College Park, Md.

Bernard R. Caldwell, director, Northwestern University Traffic Institute, Evanston, Ill.

O. W. Campbell, county manager, Dade County, Miami.

J. J. Cavanagh, president, Chicago Motor Club, Chicago.

Norman Damon, vice president, Automotive Safety Foundation, Washington, D. C.

M. R. Darlington, Jr., managing director, Auto Industries Highway Safety Committee, Washington, D. C.

A. H. Easton, professor, civil and mechanical engineering, University of Wisconsin, Madison.

James P. Economos, director, traffic court program, American Bar Association, Chicago.

Frank Flick, president, Flick-Reedy Corp., Bensenville, Ill.

Robert B. Forney, associate professor, Indiana University Medical School, Indianapolis.

E. H. Holmes, assistant commissioner, Bureau of Public Roads, Washington, D. C.

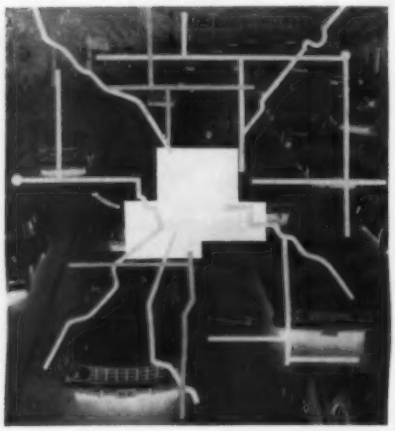
Burton W. Marsh, director, traffic engineering and safety department, American Automobile Association, Washington, D. C.

Karl M. Richards, manager, field services department, Automobile Manufacturers Association, Detroit.

Gordon H. Sheehe, director, Highway Traffic Safety Center, Michigan State University, East Lansing.

Robert P. Shumate, assistant director, research and development, field service division, International Association of Chiefs of Police, Washington, D. C.

Matthew C. Sielski, director, safety and traffic engineering department, Chicago Motor Club.



X-RAY on TRAFFIC

How the Inventory of Traffic Safety Activities *diagnoses city and state* traffic troubles and suggests solutions

by Harry Porter, Jr.

NOW THAT THEY have machines that can translate books, write symphonies, tell you who to marry and how to run your business, perhaps it's only a matter of time until someone will invent a machine which—when fed accident records and other traffic data—will come up with the solution to your community's traffic safety problems.

They're working on something of the sort at New York University, but there's no indication of its becoming operational in the near future. Meantime, there are more cars, more people and more congestion in practically every state and city in the country—and consequently more harried traffic safety workers.

But the picture is not as dark as it might seem. There *is* a method by which you can collect your community's traffic experience, have it analyzed and compared with the experience of similar communities, and receive advice on working out solutions to your problems.

This method is known as the Annual Inventory of Traffic Safety Activities. The Inventory isn't a mechanical brain—it's a service which puts a group of traffic safety experts to work on your community's problems. It doesn't toss out solutions with the speed of an electronic computer. But the solutions it arrives at are more than pat answers. They're answers based on experience and adapted to the particular problems you face.

In brief, here's how the Inventory works.

A city or state wishing to participate receives forms on which to report its various activities — accident records, engineering, enforcement, etc. When these are filled in, they are sent to the National Safety Council where a battery of experts makes an analysis. This includes analyzing the material submitted, comparing it with the performance of similar cities or states and offering advice on methods of improving the program.

Recognizes Good Jobs

Awards are presented each year to states and cities achieving excellent records in the various inventory sections. In 1960, the State of Virginia was awarded the Council's Award of Honor for balanced and outstanding traffic safety programs in 1959, as reported to the Inventory. A similar award was given to Saginaw, Mich. for its participation in the city groups.

Virginia has participated in the Inventory (or, as it was known at that time, the National Traffic Safety Contest) since 1945 (1944 activities). At that time, the state had a population of almost 3.2 million and an estimated vehicle mileage of nearly five million miles. By 1960, the state's population had risen to almost four million and its vehicle mileage to over 16 million. In this time Virginia experienced a decline from 13.0 fatalities per 100 million vehicle miles to 5.2 fatalities.

In the 15 years Virginia has participated in the Traffic Inventory program, it has been given the Grand Award for its 1953 program and the Award of Honor for its 1956 programs. The state has also taken high honors in several of the sections of the Inventory throughout the years.

Saginaw was named as the only recipient of the Award of Honor among all the cities with traffic safety programs in 1959. Saginaw is located in central Michigan close to Lake Huron. It has a predominance of manufacturing industry which utilizes more than the resident labor force. The city first participated in the Inventory in 1953 (1952 activities). At that time the city had a population of a little over 90,000. It reported 10 fatalities in 1952 for a population death rate of 10.8 (per 100,000 population). In 1959 the city reported five fatalities for a rate of 4.6.

The National Safety Council re-

Harry Porter, Jr., is manager of NSC's traffic department.

ported that both Virginia and Saginaw had outstanding programs in maintenance and use of accident records, school traffic safety education, public traffic safety education, police traffic supervision, traffic engineering and traffic courts, and in the organization of citizens and officials for effective traffic safety activity. Virginia also had excellent programs in driver licensing and motor vehicle inspection.

History of Inventory

The Annual Inventory of Traffic Safety Activities actually began in 1947. It was a development of the Action Program of the President's Highway Safety Conference. The Traffic Inventory program grew out of the National Traffic Safety Contest which was first brought out in 1932 by the National Safety Council. It was felt that the contest provided major impetus to traffic accident prevention work at that time. When the Action Program was formulated the basic features of the program were recognized as already existent in the contest. All that was necessary was a de-emphasis of the competitive aspect of the contest plus an emphasis on evaluation of traffic safety programs conducted by the cities and states.

Traffic safety individuals and professional organizations helped to develop better report form and evaluation methods for the Inventory, and they formed the nucleus for continuing advisory groups to ensure a better Inventory each year.

The National Safety Council was named to administer and coordinate the activities of the Traffic Inventory program. Financial assistance was obtained from the Automotive Safety Foundation which made it possible to offer the service free-of-charge to cities and states.

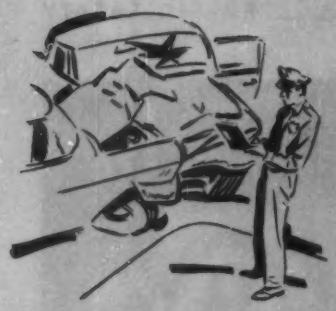
In presenting the Inventory plan to the second President's Conference late in 1947, General Philip B. Fleming, then Federal Works Administrator and chairman of the conference, offered the following comment: "This scorecard will enable the nation and every state and city to know where we stand, and what we must do to cut traffic accidents to the irreducible minimum."

The Annual Inventory of Traffic Safety Activities began its operations in 1948 to cover 1947 activities. More than 600 cities participated in the

Gov. J. Lindsay Almond, Jr., of Virginia (left) receives Award from Paul Jones, director of public information, National Safety Council.

Committee of judges discusses records of cities and states proposed for Inventory Awards for their 1959 performances in traffic safety.

Police, court and school officials of Flint, Mich., display their 1959 Inventory awards. From left to right are: Harry Porter, Jr., NSC traffic department manager, who presented awards; Capt. Joseph Bugenske, police traffic division; Rev. Harold J. Sikorski, superintendent Catholic schools; Charles C. Coulter, superintendent, board of education; Sgt. James Wheatley, police; Judge Joseph P. Friske, municipal court, and Police Chief William A. Yule.



Data on local accident experience is vital to the Inventory's probe of a community's traffic health.

Appropriate persons supply such data on special Inventory forms — send it to local coordinator for processing.

program that year, and presently twice that number take part.

The city inventory is made up of nine sections: (1) Death and Injury Record, (2) Traffic Ordinances, (3) Accident Records, (4) Traffic Engineering, (5) Police Traffic Supervision, (6) Traffic Courts, (7) School Traffic Safety Education, (8) Public Traffic Safety Education, (9) Organization for Traffic Safety Improvement. The state Inventory excludes Traffic Courts, but has Driver Licensing and Periodic Motor Vehicle Inspection.

Administration of the Inventory was, as previously mentioned, given to the National Safety Council. However, the various sections of activity in the Inventory are under the guidance of advisory groups. The advisory group for each section is composed of individuals and organizations best qualified to advise on proper programs and methods of evaluation of traffic safety activities in particular areas.

The organizations involved in these advisory functions include: the American Bar Association, the Institute of Traffic Engineers, the International Association of Chiefs of Police, the National Committee on Uniform Traffic Accident Statistics, the National Committee on Uniform Traffic Laws and Ordinances, and the American Association of Motor Vehicle Administrators.

The advisory group for each section meets periodically and reviews its respective report form and evaluation schedule. An over-all advisory group composed of the chairmen of the various section groups forms the Inventory Advisory Committee of the Traffic Conference which provides policy guidance and coordinates the work of all the sections. The executive secretaries of the groups are the Council staff members responsible for administration of the sections.

The report form is the heart of the Inventory. After the form is devised or revised the staff readies it for printing. The questions on the forms number about 700 for cities. The forms are designed to elicit information that should be contained in an appropriate program of traffic safety activities. Information is sought in three major categories: what administration and personnel, procedures, equipment and facilities, and related items a unit has; what approved policies and procedures are used, and what the extent of activity is. Criteria for evaluation are determined by the advisory groups or taken from accepted standards such as the *Uniform Vehicle Code* and the *Model Traffic Ordinance.*

On Their Way

After the forms are prepared and printed they are assembled into kits and sent to the state inventory coordinator or to the state inventory director if the city is less than 10,000 population. The state inventory director distributes the forms to the smaller cities that ask to participate in the program.

Upon receipt of the forms the city coordinator, who may be a city manager, chief of police, local safety council manager, or some other responsible community leader, gathers together all

Exhibits next go to National Safety Council where they are judged against criteria established by Inventory advisory group.

Staff experts study tell-tale symptoms of traffic trouble—make diagnosis and write prescription for improvement.

individuals who deal with the various sections to be filled out.

In the city of Saginaw, Capt. Joe Bugenske of the police department is the inventory coordinator. City officials have high praise for Captain Bugenske's work.

Capt. Robert B. King, safety officer, Department of State Police, is the Inventory director for the State of Virginia. Captain King has served in this capacity for several years. The number of awards received by Virginia in traffic safety activities attests to the diligence he has shown in serving as coordinator.

There are many capable inventory coordinators and directors throughout the country who perform their duties diligently and conscientiously. Part of the process involves calling a meeting of all persons responsible for the various sections, at which time the new form is discussed, the previous year's report is reviewed, and improved methods of reporting are discussed. A deadline is set for completion of the forms ahead of the time set for sending in to the National Safety Council.

After the forms are completed, the coordinator schedules another meeting to insure that all the facts are presented and all information called for is included. Many of the sections of the Inventory call for exhibits to give a better indication of the type of activity being carried on. For instance, newspaper clippings to indicate public safety education or a manual to indicate training procedures. The exhibits are judged on content and not on size or binding, so that elaborate exhibits are not necessary. However, some communities or states make further use of the exhibits after they are returned from use in the Inventory.

With all the forms completed and all information checked, the coordinator sends everything to the National Safety Council headquarters in Chicago.

Processing the Report

Upon receipt of a city or state Inventory at NSC headquarters, each report is put through a detailed process, which is multiplied over 1,200 times. Thus, the entire Traffic Inventory program requires about six months to complete in the processing stage. The magnitude of the work is shown by the fact that it keeps a staff of 20 going full time for the entire period, plus a large number who devote part time energy to the job. In addition, the Traffic Court Section is processed by the Traffic Court Program of the American Bar Association.

The first phase of the process involves logging in of each report. If a section of the report or some other item is missing for some reason, a card is sent to the coordinator to inform him of this fact and he is given time to find the missing section or item and submit it. It is important that each item asked for in the Inventory be submitted, since it will be assumed that a program does not have the item requested and fails to meet the standard set for this area.

When the arrival of the city report has been duly noted it is stamped with one of ten population groups. The general grouping is cities of five thousand to 10,000 population, over 10,000 (except in Traffic Engineering and Police Traffic Supervision section which break down into 10,000 to 50,000 and 50,000 and over), and the states.

Each section of the report is then given to the specialist supervising the evaluation and analysis of a particular section. As indicated earlier in this article, the evaluation of the report forms follows the method set down by the governing advisory group of each section. Some of the questions in the forms apply to the grading and scoring, while others are used as supplemental information and as a cross check on the activities reported. It is the responsibility of the supervising specialist to double check the grading and applications of the advisory group's criteria after an evaluation is completed on a city or state.

The criteria of evaluation set for a city of five thousand to 10,000 population are not the same as those set for a city of over 200,000, since the larger city is expected to have facilities not essential to a small city.

In the evaluation, a perfect score for any section merely means that the activities being carried on are equal to or exceed the performance of the top 30 per cent of the cities of similar size. This is not an indication, however, that there cannot be improvements in the city's program of traffic safety.

Each year the National Safety Council recognizes the high performance

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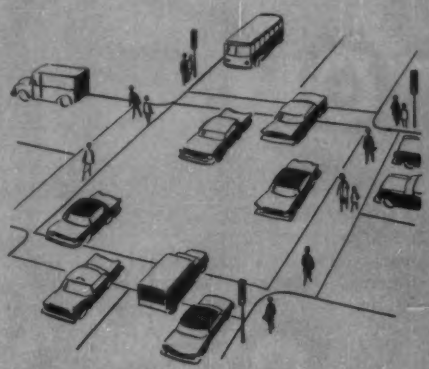
Diagnosis and prescription go back to community. Recommendations are discussed first with officials—later, at public meeting.



Most important part is follow-up. Communities heeding recommendations report lower tolls, smoother traffic flow.

MINNESOTANS ARE PREPARED

First Aid Program for State Employes on Departmental Basis

by Darrell D. Gray

Gov. Orville L. Freeman (left) congratulates first graduates.

LAST June Gov. Orville L. Freeman of Minnesota grasped the hand of Commissioner of Highways L. P. Zimmerman and commended him warmly for the completion of the first department-wide first aid training course.

Said Governor Freeman: "A safety minded program of such magnitude, involving the education of several thousand employes, will make Minnesota a safer place in which to live, work and play. It will also be a safer, more pleasant place for our out-of-state visitors to spend their vacations."

This program, the first of its kind in the nation, did not get underway without some difficulties. For a long time many state employes had promoted the idea. But before the program could get rolling, they had to overcome the opposition of those who could not foresee the benefits of such a program.

Today, as the result of the training program, more than 2,300 maintenance and construction workers, and office employes, in addition to 330 highway patrol officers are qualified to render on-the-spot first aid.

Program interest also sparked further interest in employes' welfare and led to the setting up of a first aid station in the highway department's central office building at St. Paul for emergency aid to department employes. A registered nurse, with experience in industrial health, attends to the sick and injured, and the state department of health makes available the services of a doctor.

It's too early to evaluate the program's effect on the annual casualty toll, but national safety leaders and the American National Red Cross concur with the opinion of Harry A. Sieben, state highway safety director, that "An employe with first aid training is a safer employe on the job, and his newly acquired knowledge is an asset to his employer as well as his community during emergencies."

"First aid training will help our employes reduce the severity of traffic accidents and industrial mishaps," Sieben said. "It also will contribute toward reducing the many dollars paid out by the state each year in the form of workman's compensation disbursements."

The program grew from a "seed" planted about 20 years ago when supervisors were trying to cut down accidents on and off the job. Safety education of employes was the foremost consideration but thought was also given to possible methods of helping to reduce the gravity of mishaps.

Mishaps became less frequent as workers learned not to light matches near oil and gasoline tanks, or to keep their hands and clothing away from whirling fans and biting drills. Safeguards on machinery established barriers between thoughtless workers and danger points. But too many accidents

Gov. Freeman commends L. P. Zimmerman, highway commissioner.

Darrell D. Gray is a member of the safety division of the Minnesota Highway Department.

continued to happen with a resultant loss in man hours.

Safety leaders began to look for a way to reduce the severity of a burn, to prevent infections that might lead to extended illnesses, and to eliminate the possibility of anyone bleeding to death from a gash suffered miles away from professional medical aid. There were times when heart attack victims might have survived if aid had reached them earlier.

Highway patrolmen had been trained in first aid since the initiation of their formal schooling in 1930 because they often were among the first to reach accident scenes and organization heads knew the value of emergency first aid in combating severity of injuries.

Many other highway employes were finding themselves among the first to come upon an accident scene as they went about their regular work of highway maintenance and construction. Many wanted to help the injured, but few knew the proper procedures for first aid. This was also true when accidents happened to fellow workers in maintenance shops and on construction sites in the field.

Newly formed safety committees of maintenance districts began pounding the gavel for first aid training of all workers on the theory that it would make everyone more safety conscious and also minimize after effects of accidents. The safety leaders argued that proper first aid prior to the arrival of a doctor would help keep minor hurts from developing into major disabling injuries.

A northern maintenance district and St. Paul Park went ahead on their own to inaugurate an overall first aid training program for maintenance employes, which was conducted after the regular day's work. Other districts failed to follow suit and the district-wide program wasn't repeated. It appeared as if a stalemate had been reached with only a safety minded worker here and there taking it upon himself to enroll in a local first aid course for self improvement.

But maintenance safety committees and safety supervisors at the central office in St. Paul didn't stop expounding their theories as they sought the support of engineers and administrative heads. Construction supervisors began to lend their support. Differences in the problems encountered in construction field operations and maintenance operations had made this sort of cooperation difficult to attain in previous years. As the ranks grew, each parley of committees indicated progress.

Gradually, they overcame the negative attitude of those who worried about "wasting taxpayers' money" or of making the state liable for improper first aid treatment by employes.

Safety leaders came up with statistics which showed that Minnesota taxpayers had paid out thousands of dollars in compensation in connection with injury and death. They believed that many of the extended confinement cases might have been reduced if the injured worker had received competent care at the time he was hurt or became ill. They insisted that accidents would become less frequent if all workers underwent training.

Their arguments were also backed up by reports showing that workman's compensation disbursements in 1939 and 1940 totaled $60,000 for each year—less reimbursements of "third party" cases. Not only was there a loss of money, but there was also the loss of man hours at the job.

Persistence paid off in 1959 when Commissioner Zimmerman gave approval for a department-wide first aid program and instructed personnel and training officers to set up such a course in cooperation with the safety division and the district engineers. Special methods were used to keep down training costs by utilizing available manpower and avoiding disruption of normal operations.

George Meskal, maintenance engineer, who had been an active supporter of the training plan, worked closely

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Instructor John St. Martin (center) shows first aid treatment to students Jack Griffin and Myrtle Kemp.

Prior to beginning of course, employes watched Red Cross instructor who gave artificial respiration.

Cornell Names Head Of Crash Research

The President of Cornell University, Deane M. Malott, has announced the appointment of Robert A. Wolf as director of the University's Automotive Crash Injury Research program, with headquarters in New York City.

Wolf is a member of the technical staff of Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. He is head of the Laboratory's Operations Research Department and will retain policy guidance of this group.

The Administration of Automotive Crash Injury Research contracts and grants will continue under the direction of John W. Hastie, the University's coordinator of research.

Merwyn A. Kraft, who has been acting director of the program, will continue his affiliation with the program in addition to his major responsibilities as research coordinator of the Flight Safety Foundation and acting director of Aviation Crash Injury Research.

Insurance Award Winners Announced

The Florida and New Jersey Associations of Insurance Agents were named as co-winners of the Annual Highway Safety Award Contest sponsored by the National Association of Insurance Agents.

Winners of the Highway Safety Awards for Local Associations, according to population categories, were: Insurance Board of the Palm Beaches, Miami, Jacksonville, Broward County, all in Florida; Grand Ledge, Mich., and Sacramento, Calif.

Announcement of the winners was made by the chairman of the NAIA Accident Prevention Committee, Stanley W. Greaves, River Edge, N. J. Judges in this year's contest were: William G. Johnson, general manager, National Safety Council; Richard Bennett, secretary-treasurer, Insurance Institute for Highway Safety, and William Bethea, executive secretary, President's Committee for Traffic Safety.

A look at the record on . . .

State Traffic Legislation

Twenty-eight state legislatures have met in regular or special session this year, including those of the newly admitted states of Alaska and Hawaii. Early in September, the National Highway Users Conference made a report of important legislation passed in these sessions. At the time the report was compiled all legislatures, except Delaware, Massachusetts, New Jersey, Pennsylvania and Rhode Island, had adjourned for the year. Oklahoma was scheduled to meet in special session late in September.

Following is a roundup of significant legislation relating to traffic safety as given in the NHUC report.

Highway Studies

California adopted a resolution authorizing a study of the feasibility of using river beds for freeway purposes. Georgia created a traffic safety study committee and Virginia authorized continued participation in the joint commission studying mass transit in the District of Columbia area. Several Massachusetts laws authorize the Committee on Highways and Motor Vehicles to make interim studies of various bills relating to highways, bridges and other matters. Michigan created a special legislative committee to continue the study of the administrative practices of the State Highway Department. Creation of a Legislative Highway Planning Committee has been approved in Mississippi.

Parking Legislation

Off street parking legislation has been approved in Massachusetts and Rhode Island. Virginia amended its law authorizing counties to install parking meters to permit the county manager or other officer to designate certain portions of highways and streets for installation of such meters.

Highway Administration and Programing

A resolution adopted in Alaska requests the Department of Public Works to establish a primary and secondary system of roads and administer a road program "which is equitable to all areas of the state."

A new Arizona law establishes the position of state highway director to be appointed by the Highway Commission for a five-year term. The director, with the approval of the Highway Commission, shall employ a state engineer. (Previously, the Highway Department was jointly managed by the state engineer and the secretary to the Highway Commission.)

Louisiana re-enacted 1960 legislation creating the Department of Highways composed of the director and the Board of Highways. The director is designated the head of the department and shall be appointed by and serve at the pleasure of the Governor on a full time basis. The Board consists of eight members and would also be appointed by and serve at the pleasure of the governor.

Legislation approved in Maryland this year amends the 12-year program enacted in 1953 to permit the State Roads Commission to commence construction of "vitally needed arterial highways" now instead of waiting until the period in which such arterial roads were originally scheduled for construction. Interstate System projects may be constructed regardless of the program and mileage provisions of the 12-year program. The revised program provides for completion of approximately 390 miles of arterial highways by 1966 and needed improvements to secondary roads with funds remaining in the program.

Advertising Along Highways

Laws have been approved this year in Kentucky and Virginia to restrict advertising in the area 660 feet from the Interstate System. New York approved a bill restricting advertising within 660 feet of thruways. Massachusetts enacted provisions authorizing permits for placing advertising structures along highways.

Service Facilities

Louisiana enacted legislation providing that no automotive service station or other commercial establishment for

serving motor vehicle users shall be constructed or located within the right-of-way, or on publicly owned or publicly leased land acquired or used for or in connection with a controlled access facility.

Size and Weight Limits

Increases in size or weight limits have been enacted in Kentucky, Louisiana, Mississippi and South Carolina. In addition, the District of Columbia liberalized trailer lengths within the combination length limit.

A new Kentucky law permits the Commissioner of Highways to increase the gross weight limit to 73,280 pounds on designated highways; Louisiana raised the height limit to 13½ feet. An increased gross weight limit of 64,650 pounds for designated highways was approved in Mississippi. South Carolina raised the height limit to 13½ feet and the combination length limit to 55 feet, and the District of Columbia increased to 40 feet the length limit for trailers.

Vehicle Inspection

Motor vehicle inspection proposals in substantial conformity with the Uniform Vehicle Code were enacted in Louisiana and Mississippi. Both states provide for privately owned inspection stations with an additional provision in Louisiana permitting a qualified operator of 10 or more vehicles to inspect and certify his own vehicles if he has adequate repair and maintenance facilities. The Mississippi law repeals presently unenforced inspection laws and becomes effective January 1, 1961.

New York enacted a law that exempts certain heavy-duty and maintenance equipment and off-highway vehicles.

Drivers

New York increased its maximum penalty for the first drunk driving offense and established a new traffic infraction of driving while ability is impaired by alcohol.

Michigan established a point system for driver license suspension.

Louisiana law now provides that a photograph of the licensee appear on the driver license card and imposes an additional 50 cent fee therefor.

The new Maryland driver law requiring biennial renewal provides a fee of $2; formerly a license costing the same amount was good for life.

Nevada increased its chauffeur license fee from $2 to $4 annually.

Rhode Island increased its fee for driver and chauffeur licenses from $4 to $8 for a two-year period.

A New York law requires that a driver under 18 be accompanied at night by a parent or guardian. Virginia, which permits licensing of 15 year olds, enacted a law requiring annual renewal for drivers under 18 and allowing any city to bar such drivers by ordinance.

Vehicle Equipment

The ICC has amended its lighting requirements, but the effective date was postponed from August 1, 1960, to November 15, 1960, to allow consideration of petitions by industry organizations.

Five more states—Arizona, Louisiana, Massachusetts, Mississippi and Nevada—have approved laws permitting amber parking lamps.

New York approved a measure to require two amber Class A reflectors on the front of all commercial vehicles 80 inches or wider. If less than 80 inches, amber Class B reflectors may be used.

Hydraulic brake fluid standards in accordance with the Uniform Vehicle Code have been adopted in Arizona, Kentucky, Massachusetts, Michigan, New York and Rhode Island.

California enacted a measure that requires air pollution control devices on motor vehicles operated in "smog-distressed counties." The law sets up a Motor Vehicle Pollution Control Board in the State Department of Public Health; requires control devices on all new motor vehicles and on used motor vehicles transferred in ownership one year following certification of two such devices. The requirement extends to used commercial motor vehicles after the second December 31 following certification and to all motor vehicles one year later.

Financial Responsibility

The New York Joint Legislative Committee on Insurance Regulation was directed to continue its study of laws relating to automobile liability

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Paul Jones Retires

Paul Jones, director of public information for the National Safety Council and internationally known safety speaker, retired November 1. Jones, who reached the Council's compulsory retirement age, will be retained as director of special projects and will handle special speaking and writing assignments.

J. H. Naisbitt

Paul Jones

Before coming to the National Safety Council, Jones was city editor, managing editor and promotion editor of metropolitan newspapers in Kansas City, Toledo and Cleveland.

During the 23 years that Jones headed NSC's public information work, the Council began many award programs including the Public Interest Awards to all forms of public information media and the Christmas cartoon project, an annual recognition of the nation's newspaper cartoonists for top holiday safety cartoons.

Jones emphasized during his career that safety need not be dreary and pontifical, but could be presented in a manner that would appeal to the average man and still get across the seriousness of the accident problem.

One of his last major assignments for the Council was an around-the-world trip to Holland, Saudi Arabia, the Middle East, Australia and Honolulu during which he made 28 talks and numerous radio interviews and television appearances.

John H. Naisbitt, formerly news service manager of Montgomery Ward & Co., has been named to the public information director post. Naisbitt also has served in various public relations capacities with Eastman Kodak Co., the Great Books Foundation and the Unitarian Service Committee.

CHEAPER by the DISTRICT

by John S. Urlaub

PROBABLY the first school district-wide installation of seat belts was completed recently in the Berkeley Unified School District, Berkeley, Calif. The teachers and other school personnel led the way in instituting a mass seat belt installation program.

The initial impetus came from Berkeley Superintendent of Schools C. H. Wennerberg, who appointed me coordinator of the activity. Previously the Berkeley Department of Public Health had conducted a seat belt campaign for its employes, resulting in the majority of the staff purchasing and installing seat belts in their cars.

To initiate the program, 26 teachers representing each of the 23 schools in the district met at Berkeley High School to discuss the merits of seat belts. Present at this meeting was a representative of the California Highway Patrol, who told of his organization's experience in reducing injuries to patrolmen after belts were installed in all the patrol cars.

In addition, a list of 20 standard questions and answers on seat belts was distributed and discussed. The group was naturally concerned with the objective evidence available to substantiate the claims that seat belts can reduce injuries and save lives of drivers and passengers. They were interested in the occupant's chance of extricating himself in a collision which might result in a fire or the car's plunging into a river. Also what "pull" will they withstand, are they too restraining, and just how do they minimize the possible injury?

To assist the teachers in formulating their own conclusions, a movie was shown which depicted actual crash conditions and the resultant effect on "dummy" passengers with and without seat belts.

After an additional period of questions and answers, it was the unanimous opinion of the group that belt purchasing was desirable and that a plan of selection and installation should be started immediately.

A committee of five members investigated the various types of belts available and their cost, and worked out a plan of installation which would involve a minimum of inconvenience to the purchaser. Since the highway patrol must approve all belts sold in California, the belt selected first had to meet its standards. It also seemed desirable that the belt have a metal to metal clasp and be capable of withstanding a 4,000 pound pull.

The cost to the individual employe could be minimized by wholesale buying and installation on a cooperative basis. The number of belts purchased by the teachers exceeded all expectations, with a grand total of 600 belts ordered. These were available in eight different colors matching the upholstery of the car.

The first unique feature of this program which proved to have a profound psychological effect on members of the faculty as well as students and parents was a plan of mass installation which was carried out on the school premises. Workmen came to each school by a pre-arranged schedule and installed the belts in the cars while they were standing in the teacher's parking lots. A red flag on the radio aerial quickly identified the cars for the workmen.

The second feature which seemed to gain favor with the teachers was a package deal which included the belt plus the installation. Through quantity buying, as was mentioned, the committee was able to make a price of $6.25 per belt installed. This price in itself was a determinant in the number of orders placed.

Installation was completed early in June just before summer vacation. Already at least two instances have been reported whereby the users felt that the belts prevented an injury to one or more occupants of their car. A similar program is being planned for next spring with the hopes that every faculty car will be equipped with this safety device. Berkeley teachers want

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to live safely and have taken positive action to obtain that end.

To insure a successful seat belt installation program, the following suggestions and procedures may be used as a guide.

▶ Initial impetus should come from the superintendent of schools.

▶ Appoint a chairman or coordinator of the activity. This person could be the safety supervisor, a driver education instructor or someone interested in the safety program of the school.

▶ Select a key person from each of the schools or departments involved. This person should be informed of the facts about the use of seat belts and their role in reducing injury severity. It is more effective if you can present the evidence gathered by some local or state agency, concerning its experience with seat belts. In our case the California Highway Patrol submitted evidence to substantiate the claim that users of belts sustained approximately 35 per cent fewer injuries than people

▶ Appoint a committee to select a belt that meets the standards deemed desirable. Be certain that you select a "first-line" belt that will withstand the required pull and that will not fail in an emergency. People will pay extra for a good belt.

▶ Have a faculty meeting in each school to present the facts. If possible have an expert on hand to answer questions.

▶ Work out a package deal, so that one price covers the cost of the belt plus installation.

▶ Encourage the purchase of at least two belts per car. Rear seat belts are also desirable.

▶ Install the belts on the school premises. This will afford a minimum of inconvenience to the purchaser.

▶ Have a variety of belt colors. This can easily eliminate some reluctance on the purchaser's part.

▶ The installation must be done by competent workmen. The methods of anchoring the belts must be adapted to the make and model of the car.

This type of project could very well set a pattern to be followed by many comparable school districts throughout California as well as the United States

Driver Ed Awards Announced

The 13th Annual National High School Driver Education Award Program has honored eleven states and the District of Columbia for their 1959-60 high school driver education programs.

Achievement Awards went to Arizona, Delaware, Florida, Iowa, Kansas, Michigan, North Carolina and Utah.

Progress Awards were made to the District of Columbia, Illinois and Indiana.

Progress Awards (for private and parochial schools) went to Delaware, Texas and Utah.

Michigan was voted a special award for providing driver education in the state's public schools for non-public school students.

Forty-eight states and the District of Columbia participated in the 1959-60 award program, which is sponsored by the Insurance Institute for Highway Safety. The award program is the medium recognized by the President's Committee for Traffic Safety as the annual measurement of driver education progress.

Here Are the Facts

Seventy-three per cent (12,600 of 17,227) of the nation's public high schools covered in the 1959-60 report offered a course in driver education. Fifty-six per cent of the schools provided a "qualifying course," i.e., one consisting of 30 clock hours of classroom instruction and six hours of practice driving, and taught by teachers who have met specified requirements.

Of the 2,085,734 "annual eligible students" (those reaching legal driving age during the year) enrolled in the public high schools, 1,212,992 or 57 per cent took a course in driver education in the 1959-60 school year. A little more than 770,000 or 34 per cent took a "qualifying course."

Twenty-nine states and the District of Columbia reported on private and parochial high school driver education programs for the 1959-60 school year. Of the 1,868 potential schools, 459 or 25 per cent offered a course in driver education. Two hundred and fifty-one or 13 per cent offered "qualifying courses."

The number of annual eligible students enrolled in the 1,868 private and parochial high schools was 130,359. Twenty-five per cent or 32,399 took a course in driver education, and 8 per cent or 10,240 took a "qualifying course."

To receive an achievement award in the annual award program, 60 per cent of a state's public high schools must provide a "qualifying course" in driver education and at least 50 per cent of the annual number of eligible high school drivers must be enrolled.

To receive a progress award, minimum course standards are the same as for the achievement award. While percentage achievements are not required, the public high schools (or the private and parochial high schools) must have made an increase of 10 points in "performance score" over the score for the previous school year. The "performance score" is determined by averaging the percentage of schools offering qualifying courses and the percentage of eligible students enrolled in these courses.

Dr. Walter A. Cutter, director of the Center for Safety Education, New York University, was chairman of the board of judges for the 1959-60 award program.

He observed that the percentage of annual eligible students enrolled in all driver education courses dropped 11 per cent during the recent school year —from 68 per cent to 57 per cent.

"The cause of this decline seems to be lack of public understanding and support," Dr. Cutter said. "The remedy for this is, of course, public education, particularly on the part of school administrators. It is the job of these administrators to convince the public of the need for and the benefits of a complete course in driver education for every high school student.

"In an informal survey conducted by the Insurance Institute for Highway Safety, it was found that lack of funds for the necessary materials for this course is the major problem. The most

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IT'S NO SECRET that they do things BIG in Texas.

Latest proof of this is the statewide Labor Day campaigns put on by the Texas Jaycees and the Texas Council of Safety Supervisors in cooperation with Gov. Price Daniel's stepped up highway safety program.

One thousand two hundred and fifty-four Texas Jaycees spent 10,321 hours over the holiday weekend serving coffee, soft drinks, cookies and other refreshments to the traveling public in an effort to curb accidents and deaths. They also distributed safety literature.

The program was carried on under the direction of Melvin Kieke of Houston, chairman of the state Junior Chamber of Commerce safety committee; W. F. Leonard, vice president of the Texas Safety Association in charge of traffic, and Don C. Baker, executive vice president of the Texas Jaycees.

The whole idea originated in 1958 when the Longview Jaycees in deep east Texas and the Monahans Jaycees in far west Texas, some 525 miles apart, undertook a "safety break" project to keep U. S. 80 free of Labor Day traffic deaths through their respective counties of Gregg and Ward. They invited other Jaycees to do likewise. There were no traffic deaths on U. S. 80 during that period.

Other Clubs Join In

The idea spread and many other clubs took part in various sections of the state. Jaycee organizations not located in cities along U. S. 80 adopted the idea for their own counties and for the main highways crossing them.

The campaign was held again in 1959. While no official reporting was done on the 1959 project, Jaycee officials believe most of the 205 units did something for traffic safety over the Labor Day weekend. One death was reported on the Texas section of U. S. 80 during that holiday.

In September 1959, Bill Leonard held a meeting with the Longview Jaycees to review the 1959 campaign and plan for the future. Delegates came out of this meeting with a plan to expand the project to include all of U. S. 80 from Savannah to San Diego.

Presidents of the state Jaycee organizations in Georgia, Alabama, Mississippi, Louisiana, New Mexico, Arizona and California areas—through which the 2,568 miles of U. S. 80 pass—were contacted and asked to join.

John W. Lassiter of Savannah, immediate past president of the Georgia Jaycees, said his organization had sponsored highway safety breaks for the past several years, had received national recognition for the idea, obtained official Jaycee approval of it as a national project, and would conduct it in Georgia again this year.

Phoenix, Ariz. Jaycees reported that nine Arizona units would establish four safety breaks on U. S. 80 through their state and that 200 Jaycee members would take part.

Don Wallace of Aztec, N. M. said that two Jaycee clubs with 45 members would arrange two safety breaks along U. S. 80 in his state.

The Jaycees' highway safety breaks usually involve erection of large signs inviting motorists to take a safety break by stopping for free coffee, cold drinks, road information and safety suggestions.

In some places extra touches were added. In Waco, Jaycees using six airplanes kept a close eye on traffic within a 100-mile radius of their community, reporting accidents, traffic congestion and violations by radio to the state police. Garland Jaycees staged a parade which was witnessed by 20,000 spectators. In El Paso the Jaycees recommended giving a free funeral to some careless motorist. In Laredo they conducted forums on traffic safety with the assistance of radio and TV stations.

Good News Coverage

Here's a local newspaper's view of a Jaycee safety break. The town is Brownfield—the newspaper the Brownfield *News-Herald*.

"They stopped and relaxed a few minutes in Brownfield Saturday—travelers from all over the area, the state of Texas and 10 other states . . . .

"From 12 noon Saturday to late Saturday night, the junior chamber members handed out case after case of free soft drinks and coffee, washed bug-spattered windshields, answered tourists' questions and provided the travelers a chance to stretch their legs and relax . . . .

"More than 300 drivers registered their names with the Jaycees as they drank refreshments. Approximately 1,500 persons stopped at the stand.

"Probably 90 per cent were from the South plains and Panhandle area—but they also came from Michigan, Oklahoma, New Mexico, Iowa, California, Colorado, Wisconsin, Arizona, Massachusetts, Illinois and New York.

"For instance, Mr. and Mrs. Jim Blunt of Phoenix, Ariz. chatted with Charles Renick of Boston, Mass. as they drank their coffee. . . .

"It was strictly a cross-section of America. At one time, travelers from Wilson, Okla., Dumas, Tex., Syracuse, N. Y., and Denver, Colo., were all stopped for refreshments."

These quotes are part of a full page spread given to the coffee break in the *News-Herald*. Some of the pictures used in the same spread are reproduced on these pages. Newspapers and radio and TV stations in all communities in which coffee breaks were held went all out to give the program coverage. Due to the fine publicity, drivers who had no contact with the coffee breaks themselves were constantly reminded of the need for rest stops on long trips, for careful driving and for vehicle checks.

Many others cooperated to make the campaign a success. In its monthly publication the Texas Jaycees published this acknowledgment:

"Thanks surely go to the various insurance companies which provided considerable literature for distribution, the members of our Armed Forces who assisted in many ways, local civic clubs and chambers of commerce who lent their time, money and effort to the program, local merchants who gave and then gave some more, and to the protectors of the peace, the local and state law enforcement officers and officials whose cooperation was excellent."

Holiday Road Patrol

The Texas Council of Safety Supervisors, an organization of fleet safety directors for Texas truck operators, ran a complementary program.

Safety supervisors and personnel of truck fleet operators volunteered their own holiday time and equipment to provide emergency assistance to motorists on several main state highways.

Their project was known as the Holiday Road Patrol. Participating cars and trucks, carrying signs identfying them with the program, offered free emergency service to motorists in trouble. They did not attempt to do any police or law enforcement work.

The special cars and trucks operated along highways out of Alice, Austin, Buffalo, Colorado City, Corpus Christi, Dallas, Fort Worth, Nacogdoches, Waco and Wichita Falls.

The supervisors summed up their aim in a message to the governor. "This is our way of trying to help in your campaign to reduce collisions,

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Brownfield Jaycee cleans windshield while Iowa driver has coffee. Note wrecked car (at rear) used as prop.

Before refreshments, travelling family registers at Safety Stop. Jaycees also gave tourists information.

Seat Belt Pilot Program:

HOOSIER BELT SALES SOAR

MORE seat belts were sold in Fort Wayne-Allen Co. (Ind.) during the first six weeks of the area's current seat belt program than were sold in the same area during the entire year of 1959.

The number of belts sold in the first six months in the test area exceeded 13,800.

The Fort Wayne program is a pilot program, sponsored by the American Medical Association, the National Safety Council and the U. S. Public Health Service in conjunction with their nationwide seat belt educational program. The project will soon enter its final months. Begun last February, the year-long project hopes to uncover the major barriers to seat belt purchase, installation and use, and the means to overcome them.

Efforts are also being made during the test period to learn the best methods of enlisting the support of civic, business and service groups in a project such as this one. Extensive publicity has focused nationwide interest on the test area, and the results obtained there.

Initial phases of the project determined the extent to which seat belts were in use in the test area prior to the campaign. The increase in the use of belts was measured when the public was contacted through the use of various media and schools, churches and employers. Slogans, speeches, posters and contests were used to get the message across. The test area was blanketed with publicity via radio, television, newspapers and special interest magazines. A careful tabulation was made to gauge the public's response.

"Public interest in installing and using safety seat belts in their automobiles has far surpassed expectations of the program's sponsors," said Melvin Slater, the program's supervisor.

From January to July, while 818 occupants of automobiles were injured in accidents in Fort Wayne alone, no person using a seat belt was seriously injured.

The success of the program thus far is largely due to energetic and coordinated program by a committee of prominent Fort Wayne business and civic leaders with the support of the area's media.

Early in the program state police officers demonstrated the use of seat belts, using a state police vehicle and cutaway sections of an automobile in a 30-minute, live television show. Accident pictures were also used to show how seat belts can promote passenger safety. A panel discussion—in which local people discussed the pros and cons of seat belt use—was conducted on the show. Public acceptance was excellent and increased interest in seat belts was immediately evidenced.

A second 30-minute TV program was produced in November.

A 25-minute radio show along similar lines was also produced.

Spots Blanket Area

Radio and television stations covered the area with spot announcements. State, county and local law enforcement agencies and other groups cooperated in the production of the announcements. The campaign had a bonus effect when several national television shows included safety belt promotions. Sales and installations of belts increased significantly after the TV presentations.

The program's committee has conducted several other activities which have proved highly successful: a speaker's bureau which provides people to make talks at promotions and to various groups; promotion of the program among civic, business and fraternal groups; a school essay contest; a special accident form to be used for enforcement officer's reports; enlistment of aid from business and trade organizations, and employer support through the installation of belts in company cars.

A travelling seat belt display case is being used for promotional events throughout the area, and belt installation diagrams are being circulated, while a concentrated promotion is being carried out in local industries stressing off-the-job safety.

An off-the-job seat belt program was developed in a local industry. In a two-week effort, safety belts were given a concentrated promotion with belts offered at a reduced cost. Literature was distributed, a Public Health Service film was shown, public address system announcements were made, and personnel contacts were made by the firm's safety department members and various department heads.

Another local industry sponsored the printing of 1,500 safety belt pamphlets which were specially aimed at industrial employes.

During the summer, a special prevacation display was constructed, utilizing a seat-belt-equipped state police car which was rotated among industrial parking lots. Local Boy Scouts also carried out a demonstration illustrating the advantages of seat belts.

When officials of the sponsoring organizations met in Fort Wayne, early in September, they reported that they were tremendously pleased with the progress of the program, which had drawn attention to itself from safety bureaus across the country.

A further step-up in publicity for the program is to be conducted through news media, and extra effort will be expended to obtain additional cooperation from dealers and installers of seat belts.

The safety director of the Indiana State Police is cooperating in the production of spot announcements for the closing months of the study.

The study is based on a grant from the seat belt webbing manufacturer's association—The Narrow Fabrics Institute. Detailed records of program activities are being kept. The records will be used to evaluate various components of the study. One of these components is a survey to obtain general information on seat belt installation and use. In May, recorded statistics were checked against the figures obtained through the Annual Vehicle-Safety Check program to verify the percentage of seat belts in use before the campaign's introduction, and during its first weeks.

Safety-Check Results:

All-time Low in Unsafe Vehicles

Results of the 1960 National Vehicle Safety-Check program show an all-time low percentage of vehicles in unsafe operating condition. For the first time in the 13-year history of the annual campaign, ONE out of every SIX cars and trucks going through local check lanes and dealer service departments was found to need immediate service attention to at least one of the 10 items affecting safe driving condition. For the last five years, one out of five vehicles had been found with at least one unsafe item.

"This improvement demonstrates a growing public awareness of the importance of maintaining vehicles in safe driving condition," declared M. R. Darlington, Jr., director of the program.

A new record high total of more than 3.2 million vehicles were safety-checked during the 1960 campaign urging motorists to "Join the Circle of Safety—Check Your Car . . . Check Your Driving . . . Check Accidents." The number of programs conducted also reached a new high of 2,955. Vehicle checks were made in cities and counties, at military installations, by teen-age groups, and by industrial plants and government agencies for employees and their own vehicles.

The Vehicle Safety-Check is sponsored by the Auto Industries Highway Safety Committee and *Look* Magazine, with the cooperation of the Association of State and Provincial Safety Coordinators.

For the sixth consecutive year, rear lights headed the list of items most often found in need of attention. These were followed in order of frequency by front lights, brakes, exhaust systems, and tires. The percentage incidence of faulty rear lights was also the highest ever—31.2 per cent. For the first time since 1951, the percentage of windshield wipers needing maintenance attention exceeded that of steering mechanisms. For the second straight year, brakes were in third place, however the percentage of defective brakes uncovered was the lowest on record—13.6 per cent. Other items included in the 10-point safety-check were glass, horn, and rear view mirrors.

The voluntary safety-check program is conducted annually during May and June in states not requiring official motor vehicle inspection. Two states which participated in the 1960 campaign will be missing from those taking part in 1961. Mississippi and Louisiana have recently adopted legislation requiring official inspection of motor vehicles, thus reducing to 32 the number of states where programs may be conducted next year.

A total of 88 safety-check award-winning programs were selected in July by a national board of judges to recognize outstanding 1960 city, county, and teen-age safety-check activities. Great Falls, Mont., and Thermopolis-Hot Springs County, Wyo., won grand awards for conducting the most outstanding city and county programs in the nation. Young drivers in Portland, Oregon, were named winners of the "Circle of Safety" Grand Award for conducting the most outstanding teen-age safety-check; Coffeyville, Kan., teen-agers were judged to have given the most outstanding teen-age assistance to a city or county.

Breakdown of Items

TOTAL VEHICLES SAFETY-CHECKED: 3,216,164

Reports of 1,888,626 vehicles Safety-Checked are not included in these tables due to insufficient data submitted.

Items Checked	Cars	%	Trucks	%	Total	%
Rear Lights	112,547	31.3	8,941	30.8	121,488	31.2
Front Lights	63,115	17.6	4,441	15.3	67,556	17.4
Brakes	49,476	12.7	3,403	11.7	52,879	13.6
Exhaust	36,454	10.1	2,626	9.1	39,080	10.0
Tires	31,764	8.8	1,940	6.7	33,704	8.7
Windshield Wipers	20,579	5.7	2,002	6.9	22,581	5.8
Steering	19,640	5.5	1,301	4.5	20,941	5.4
Glass	13,324	3.7	2,034	7.0	15,358	3.9
Horn	8,988	2.5	1,252	4.3	10,240	2.6
Rear View Mirror	4,203	1.2	1,084	3.7	5,287	1.4
	360,090	100.0%	29,024	100.0%	389,114	100.0%

The preceding breakdown is based on the following reports of vehicles checked and rejected:

1,245,806 cars checked — 240,887 rejected
81,732 trucks checked — 16,890 rejected

Of these—162,264 cars and trucks were reported corrected and rechecked.

Vehicles Reported in Need of Service Attention

(Including those reported checked and rejected with no breakdown of items)

	Cars	Trucks	Combined Cars & Trucks	Total Vehicles
Total Checked	1,373,420	92,227	1,236,820	2,702,467
Total Needing Attention	260,012	18,105	162,380	440,497
Percentage	19.0%	19.6%	13.1%	16.3%

Plight of Traffic Orphans Told by Award-Winning Writers

An editorial and a story about 31 children orphaned through traffic accidents earned $500 first place awards in the 1960 Newspaper Safety Writing Competition for two writers of the Akron (Ohio) *Beacon Journal.*

The naming of Tom Horner, who wrote the editorial, and Helen Waterhouse, who wrote the story, as winners of two of the three first place awards marked the first time in the six-year history of the contest that more than one cash award was won by writers for a single newspaper.

The third $500 first place award in the contest, sponsored by the American Trucking Associations, went to Dexter Ellis of the *Deseret News,* Salt Lake City, Utah, for his series of articles explaining how various types of fatal traffic accidents occurred.

The *Honolulu Advertiser* was named as the first winner of a special plaque, introduced in the competition this year, for the most effective overall traffic safety campaign of 1960. For 90 days the *Advertiser* ran a series of photographs and hard-hitting captions graphically depicting the effects of rear-end collisions. At the end of the campaign, a reduction of 18 per cent in this type of accident had been achieved.

Winners of the sixth annual safety writing competition were announced by ATA President Welby M. Frantz before a general luncheon at the 27th annual convention of the ATA.

Nine cash prizes totaling $2,700 and one merit citation were given for articles and editorials which were judged most effective in promoting highway safety. Certificates and plaques also were won by the writers and the newspapers they represented.

Judges of the contest were Robert U. Brown, publisher and editor of the newspaper trade publication, *Editor & Publisher;* Joseph C. Ingraham, automobile editor of the *New York Times,* and Robert J. O'Donnell, acting manager of the Greater New York Safety Council.

Ellis' series of articles in the *Deseret News* was entitled "Diagram for Death" and explained in terse, graphic terms the circumstances which resulted in various types of fatal accidents. Published "with the hope that they may help others to avoid death-dealing situations," the series was praised by the judges for its well-written, attention-getting headlines and for its clear diagrammatic drawings of fatal traffic accidents.

The plight of 31 Akron area children whose parents were killed in traffic accidents provided the material from which Horner and Miss Waterhouse wrote their prize-winning *Beacon Journal* entries. In his editorial, "Put Your Child in This Picture," Horner, awarded a merit citation in the 1957 competition, warned parents that "these (31) living traffic victims will pay all through their lives for the folly, the moment of inattention, the violations of some driver."

Miss Waterhouse described in moving terms the tragic effect that the loss of their parents had upon the 31 children in her story, "Try to Salvage Shattered Lives."

Contest judges (left to right) Robert U. Brown, publisher and editor of *Editor and Publisher;* Robert J. O'Donnell, acting manager, Greater New York Safety Council, and Joseph C. Ingraham, automobile editor, *New York Times,* weigh merits of entries in ATA writing contest.

COMING EVENTS

Jan. 26-28, Berkeley, Calif.

18th California Street and Highway Conference presented by Institute of Transportation and Traffic Engineering, and University Extension, U. of California. Held at University's Berkeley Campus. Contact John Moran, city engineer, Oakland, Calif.

Feb. 2-3, Madison, Wis.

Wisconsin Council of Safety, Inc. 19th Annual Mid-Winter Safety Conference and Exposition. Hotel Schroeder, Milwaukee. Contact R. W. Gillette, Wisconsin Council of Safety, 454 Washington Bldg., Madison 3, Wis.

March 5-7, Atlanta, Ga.

Southern Safety Conference and Exposition. Atlanta Biltmore Hotel. Contact W. L. Groth, executive director, Southern Safety Conference, Inc., P. O. Box 8927, Richmond 25, Va.

Mar. 14-15, Fort Wayne, Ind.

1961 Northeastern Indiana Safety Conference and Exhibit. Contact Ivan A. Martin, manager, Safety Council, Chamber of Commerce Bldg., Fort Wayne, Ind.

Mar. 28-30, Los Angeles, Calif.

Eighth annual Western Safety Congress & Exhibits. Ambassador Hotel. Contact Joseph M. Kaplan, manager, Greater Los Angeles Chapter—NSC, 3388 W. 8th St., Los Angeles 5, Calif.

April 3-4, Boston, Mass.

Fortieth Annual Massachusetts Safety Conference and Exhibit. Hotel Statler Hilton, Boston. Sponsored by Massachusetts Safety Council, Safety Council of Western Massachusetts and Worcester County Safety Council. Contact Bert Harmon, manager, Massachusetts Safety Council, 54 Dovenshire St., Boston 2, Mass.

BOOSTER MATERIALS

ORDERS FOR NEW POSTERS SHOWN CANNOT BE SHIPPED UNTIL AFTER JANUARY 1

HOLIDAY KITS GOING FAST

Response to the Christmas Holiday Kit offered by the National Safety Council's Religious Activities Committee has been very encouraging. Over 3,400 kits have been mailed to state governors, clergymen, members of industry, driving schools, military installations, and state and local safety councils. A general mailing has been made to most of the nation's colleges and universities.

The kit is the backbone of the National Safety Council's "Safe Holidays" campaign, and was displayed at the recent 48th Annual National Safety Congress where it elicited enthusiastic comment. Copies of the kit were offered in the Congress' Exhibition Hall and many delegates and visitors obtained them to take back to civic or enforcement officials, or clergymen in their communities.

Harold Holmes, manager of the National Safety Council's Religious Activities Department, reported that the kits received high praise from members of the National Committee of Religious Leaders for Safety and the Committee of State and Local Safety Organizations, both of which held meetings at the Safety Congress. Many committee members stressed the value of the kit as a tool for use in campaigns conducted by interdenominational groups.

Chairman of the Religious Leaders for Safety, Gov. Arthur B. Langlie, praised the kit and expressed his hope that it would be used as the basis for many local holiday campaigns.

The Christmas Holiday Kit contains posters, leaflets, a Winter Driving booklet, news releases and reprints of articles from TRAFFIC SAFETY and HOME SAFETY REVIEW. Kits are still available, free of charge, by writing to: Christmas Holiday Safety Campaign, National Safety Council, 425 North Michigan Ave., Chicago 11.

NEW TRAFFIC POSTERS FOR MARCH POSTING

©NATIONAL SAFETY COUNCIL

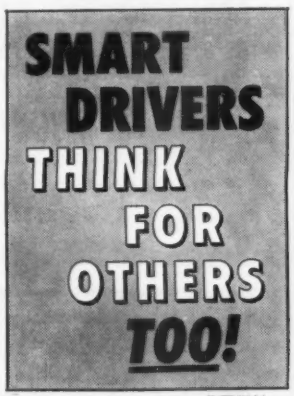
T-2058-C	25x38
T-2059-A	8½x11½

©NATIONAL SAFETY COUNCIL

T-2060-B	17x23

ALTERNATE POSTERS FOR MARCH POSTING

(These posters may be ordered for immediate delivery)



©NATIONAL SAFETY COUNCIL

T-1801-C	25x38
T-1802-A	8½x11½

©NATIONAL SAFETY COUNCIL

T-1803-B	17x23

PRICES FOR ABOVE POSTERS

Traffic Posters—T-prefix to number

	1-9	10-99	100-999	1000-4999*
A Size	$0.17	$0.12	$0.07	$0.06
B Size	.30	.20	.165	.132
C Size	.40	.30	.24	.22

YOUR CREDIT LINE can be imprinted at time of the press run on Traffic B and C posters only. Orders for imprints on March posters above must be received by January 10, 1961.

Imprinting charges for these posters are $2.25 per lot plus an initial charge for each electroplate of $21.00 for C poster imprint and $12.50 for B poster imprint.

*Write for prices on quantities of 5,000 or more for special rates on annual poster orders.

PRICES SHOWN ARE SUBJECT TO A DISCOUNT OF 10% TO NATIONAL SAFETY COUNCIL MEMBERS

FLEET POSTERS

POSTER PRICES

Posters illustrated on these pages are included in the automatic Motor Transportation poster services. Automatic poster sets are available on yearly subscription that provides (4) subjects per month viz. (2) "A" size (8½"x11½") and (2) "B" size (17"x23"). 281.31 Automatic service is provided in the following categories:

City Truck Intercity Truck Sales Truck Truck Terminal	City Bus Intercity Bus Taxicab Bus Terminal	Annual price 1-4 sets, $9.90; 5-49, $7.80; 50 or more, $6.44.

Posters are available for individual selection at the following prices:

	1-9	10-99	100-999	1000-4999*
A size, any selection	.17	.12	.07	.06
B size, any selection	.32	.23	.195	.155

All prices shown are subject to a 10% discount to National Safety Council Members. *Write for prices on quantities of 5,000 or more. See page 29 for prices of posters with T-prefix.

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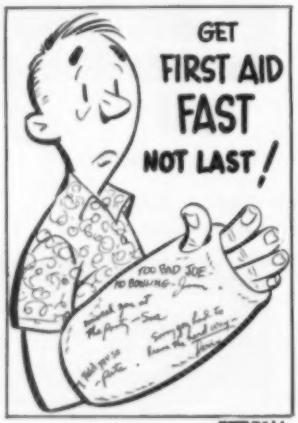
V-2025-A **8½x11½**



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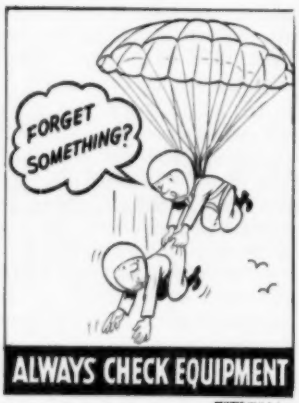

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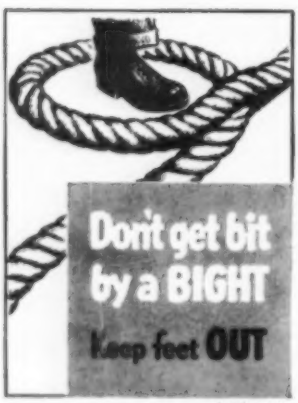

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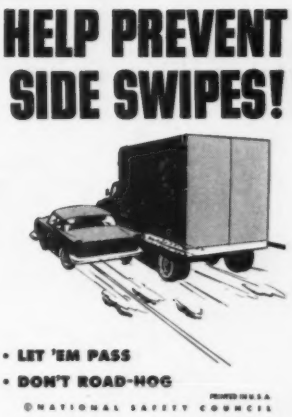

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V-1150-A 8½x11½

Remember- winter driving demands EXTRA caution
1 DECREASE speed
2 INCREASE following distance
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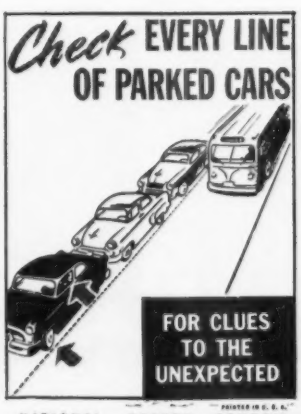

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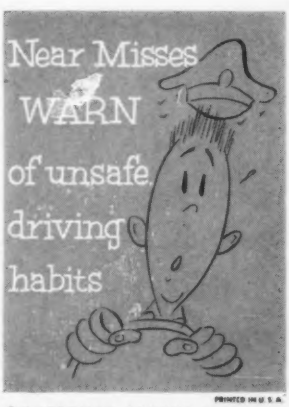

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Outstanding Driver Competition Shows . . .

TOP PERFORMERS IN ACTION

by Alfred C. Finch

Early in October, Minnesota Highway Patrolman Alex J. Keilen was selected as the nation's outstanding driver in a 1,300 mile test drive which climaxed the first national study of what makes a driver safe.

The special project, conducted by the Safety Research and Education Project, Teachers College, Columbia University, was sponsored by the Telex Division of Du Pont. The National Safety Council, Dodge Division, Chrysler Corp., and Remington Rand cooperated in the program.

Keilen competed with Charles J. Espich, a long-haul truck driver from Ft. Wayne, Ind., in a three day drive from Fraser, Colo., to Furnace Creek, Calif. Espich and Keilen, both National Safety Council long term award winners, were chosen from six semi-finalists. The six were picked by Univac from nearly 300,000 professional drivers who have received NSC awards. (See *Traffic Safety*, November, 1960.)

Following is an account of the final test drive by NSC's director of motor transport, who made the trip from Fraser to Furnace Creek as a member of the observer team.

DO the actions of other drivers irritate you? Do the sudden starts, abrupt stops and lack of communication between you and those other drivers irk you?

If so, you're like most drivers—sometimes pushed to the point at which patience gives out and temper takes over, creating an accident-inviting environment. And, also like most drivers, you probably have a mental picture of the ideal "other" driver—one whose smooth performance issues no invitation to accident.

We in the test group who observed the final contenders in the Outstanding Safe Driver competition saw two such drivers in action.

On the entire 1,300 mile journey over some of the nation's most beautiful—but most exacting—highways, both Alex Keilen and Charles Espich exhibited the characteristics we would all like to find in every "other" driver we meet.

The entire test was under the direction of Dr. James L. Malfetti, executive officer of the Columbia University Safety Research and Education project of which the Outstanding Safe Driver competition was a part. Conducting the Fraser-Furnace Creek run were Prof. Amos E. Neyhart, director, Institute of Public Safety, Pennsylvania State University, and Edward J. Emond, director of automotive safety, Armour and Co.

At the take-off from Fraser, Colo., Charles Espich was behind the wheel of a specially equipped Dodge station wagon. Beside him sat Professor Neyhart, who was to observe every move each competing driver made and record significant data on a reference sheet. Sitting back by the test panel, Ed Emond watched the tell-tale instru-

What Makes Him Safe?

Alex J. Keilen, a Minnesota State highway patrolman for the past 25 years and winner of 25 National Safety Council Safe Driving Awards, credits his remarkable safe driving record to the fact that he sees an average of one bad accident a week—and someday figures it might happen to him.

The 52-year-old patrolman drove a total of 33,000 miles last year, some of them at in-line-of-duty speeds well over 100 m.p.h. Nevertheless, he has chalked up the record of never having any type of traffic accident or violation in his driving career—which includes 10 years prior to joining the highway patrol in 1936.

In observing highway accidents and violations, Keilen estimates that the vast majority are traceable to three factors: failure to yield right-of-way, speeding and driving while intoxicated. Elimination of these three "fatal errors," he believes, could cut accidents by more than 75 per cent.

Alfred C. Finch is manager of the National Safety Council's motor transport department.

ments designed to record the various mechanical functions of the car related to driver performance.

Alex Keilan started the trip as a passenger in the observer car, which was piloted by Chief Gilbert R. Carrel of the Colorado Highway Patrol. I also rode in the observer car. This car was later presented to the winner. Throughout the trip the competitors —at one to two hour intervals—alternated their roles as driver of the test car and passenger in the observer car, to equalize factors of driving terrain upgrade, downgrade, curves and general driving conditions.

The first day's trip ended in Salt Lake City. Weather conditions were favorable most of the day. The temperature was about 12 degrees above zero at Fraser when we started in the morning, but quickly reached a comfortable 60 degrees and remained there during most of the trip.

Occasionally the run was marked by rainfall, such as the morning we left Salt Lake City. Skies were overcast with low hanging clouds, and humid weather conditions prevailed during much of the day. Snow had fallen during the night and could be seen on the mountains to the east of the course, giving an indication that road conditions could be severe in these parts during winter months.

During this portion of the run, rural highways, two lane roads, city traffic and limited access highways

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The mayor of Fraser wished contestants good luck as they took off.

Gilbert Carrel, chief, Colorado Highway Patrol, piloted observer car.

Alex Keilen smiles in background as Mark Robeson, vice president for motor transport, presents Mrs. Keilan with corsage. Scene took place at the National Safety Congress, where finalists were feted.

Contest received heavy press coverage. Here cameras click as Al Finch (second from left) congratulates winner Alex Keilen (right). Charles Espich (left) and Dr. Malfetti (second from right) look on.

Highlight of the week was the General Motors Luncheon honoring winners of NSC's Safe Driver Award. Dr. W. Ballentine Henley, president of the Los Angeles College of Osteopathic Physicians and Surgeons, gave inspiration-packed address.

MOTOR TRANSPORT AT THE

CONGRESS

Richard O. Olson, safety director of Dan Dugan Oil Transport Co., received Marcus A. Dow Award.

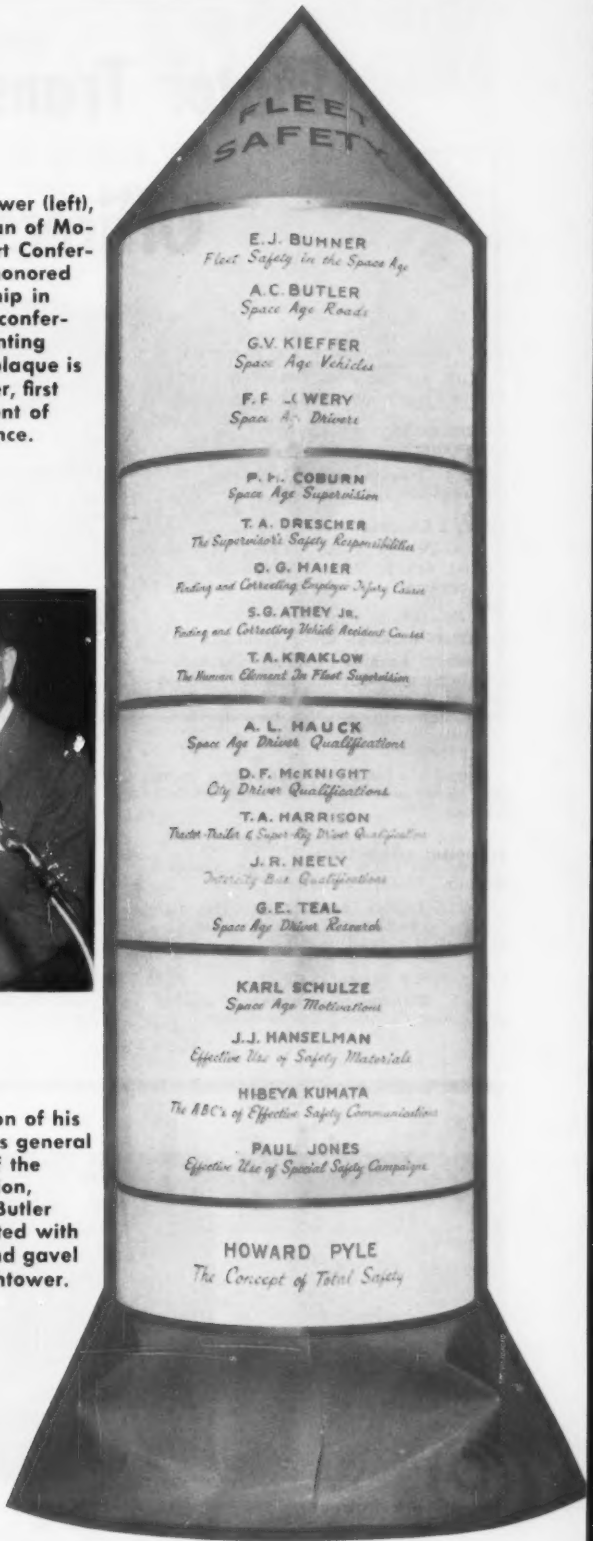
Safety in the space age was the subject that concerned fleet people at the 48th Annual Safety Congress. But there was nothing "way out" about the sessions. Delegates adopted a down-to-earth approach to the problems of the swiftly changing present—acquired know-how to move fleets safely in the years ahead.

Awards for Work Well Done

J. P. Hightower (left), first chairman of Motor Transport Conference, was honored for leadership in organizing conference. Presenting gavel and plaque is E. J. Buehner, first vice president of the conference.

L. F. Purves, outgoing general chairman of Commercial Vehicle Section, received a plaque in appreciation of his outstanding service. E. J. Buehner did the honors.

In recognition of his two terms as general chairman of the Transit Section, J. Godfrey Butler was presented with a plaque and gavel by J. P. Hightower.



Rocket in Motor Transport headquarters at Chicago's La Salle Hotel points up space age theme.

Motor Transport Conference

Officers 1960-1961

VICE PRESIDENT FOR MOTOR TRANSPORT

Mark Robeson, vice president, Yellow Transit Freight Lines, Inc., Kansas City, Mo.

CHAIRMAN MOTOR TRANSPORT CONFERENCE

A. J. Naquin, safety counselor, New Orleans Public Service, Inc.

CO-VICE CHAIRMAN OF CONFERENCE

J. A. De Pew, General Chairman—Commercial Vehicle Section, director of safety and personnel, Dohrn Transfer Co., Rock Island, Ill.

CO-VICE CHAIRMAN OF CONFERENCE

Paul J. Fanning, General Chairman—Transit Section, director, bureau of personnel and safety, San Francisco Public Utilities Commission.

SECRETARY

Alfred C. Finch, director, motor transport department, National Safety Council, Chicago.

STANDING COMMITTEES

AWARDS

M. G. Bullock, assistant manager, engineering department, Transit Casualty Co., St. Louis.

CONFERENCE MEMBERSHIP

D. L. Williamson, supervisor of accident prevention, Cleveland Transit System.

MEDICAL ADVISORY

Harold A. Brandaleone, M.D., chairman, Committee on Standards for Motor Vehicle Drivers, Industrial Medical Association, New York City.

NATIONAL FLEET SAFETY CONTEST

H. K. Halbrooks, director, accident prevention division, National Automobile Transporters Association, Washington, D. C.

NOMINATING

J. P. Hightower, Safety, Personnel and Communications, Consolidated Freightways, Inc., Indianapolis.

PROGRAM

J. W. Lumpkin, manager, safety division, Railway Express Agency, Inc., New York City.

PUBLICATIONS

Karl Schulze, senior safety engineer, Standard Oil Co. of California, Western Operations, Inc., San Francisco.

RESEARCH

R. N. Papich, safety consultant, American Gas Association, New York City.

SELECTION AND TRAINING

C. D. Calkins, manager, safety and personnel, Pacific Motor Trucking Co., San Francisco.

VICE CHAIRMAN OF COMMERCIAL VEHICLE SECTION

A. S. Lombardi, director, safety and personnel, Western Truck Lines, Ltd., Los Angeles.

VICE CHAIRMAN OF TRANSIT SECTION

J. M. Busby, Jr., safety superintendent of transportation, Memphis Transit Co.

MEMBERS AT LARGE

J. Godfrey Butler, director of personnel and labor relations, D. C. Transit System, Inc., Washington, D. C.

E. G. Cox, chief, section of motor carrier safety, Interstate Commerce Commission, Washington, D. C.

Harold R. Hosea, director of research, National Association of Motor Bus Owners, Washington, D. C.

F. S. Lake, director of safety, Interstate Motor Freight System, Inc., Grand Rapids.

W. G. Macintosh, manager, engineering department, Hartford Accident & Indemnity Co., New York City.

L. F. Purves, superintendent, transportation and safety, *Toronto Star*, Ltd.

G. D. Sontheimer, director, department of safety, American Trucking Associations, Inc., Washington, D. C.

Mark Robeson

A. J. Naquin

J. A. De Pew

Paul J. Fanning

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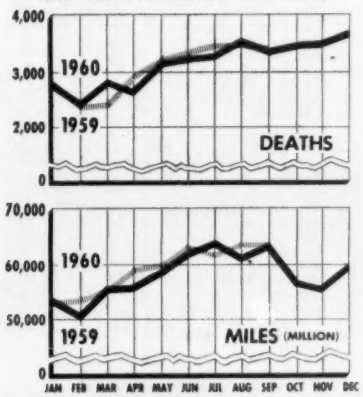
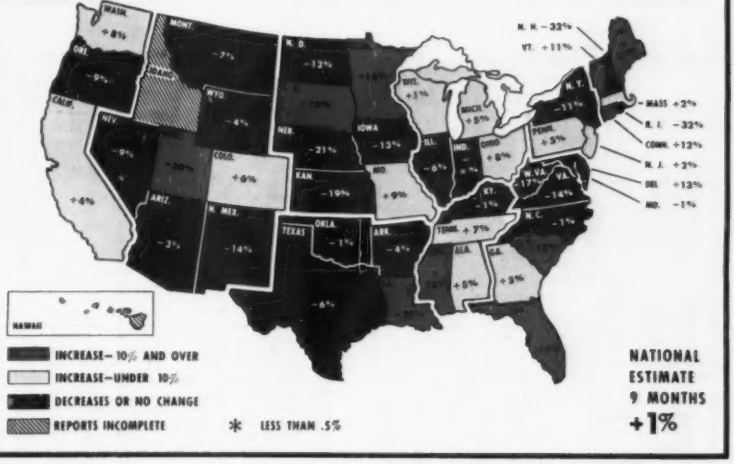
ranked according to the number of deaths per 10,000 registered vehicles, were:

	Reg. Rate	Pop. Rate
Group I (Over 1,000,000 Pop.)		
Chicago, Ill.	2.5	6.6
Detroit, Mich.	2.9	9.8
Los Angeles, Calif.	3.0	16.4
Group II (750,000 to 1,000,000 Pop.)		
St. Louis, Mo.	2.4	8.6
San Francisco, Calif.	2.7	10.3
Cleveland, Ohio	3.2	10.1
Group III (500,000 to 750,000 Pop.)		
Seattle, Wash.	1.3	6.7
Milwaukee, Wis.	1.4	6.4
Houston, Texas	1.8	10.7
Group IV (350,000 to 500,000 Pop.)		
Oakland, Calif.	2.0	8.0
Denver, Colo.	2.0	11.8
Portland, Ore.	2.4	13.9
Group V (200,000 to 350,000 Pop.)		
Wichita, Kan.	0.7	4.2
Grand Rapids, Mich.	0.8	4.4
Miami, Fla.	1.2	9.8
Group VI (100,000 to 200,000 Pop.)		
Wilmington, Del.	0.7	3.6
Saginaw, Mich.	0.7	3.7
Yonkers, N. Y.	0.7	2.2
Group VII (50,000 to 100,000 Pop.)		
Schenectady, N. Y.	0.0	0.0
Colorado Springs, Colo.	0.0	0.0
Lexington, Ky.	0.0	0.0
Group VIII (25,000 to 50,000 Pop.)		
Whittier, Calif.	0.0	0.0
Plainfield, N. J.	0.0	0.0
Appleton, Wis.	0.0	0.0
Group IX (10,000 to 25,000 Pop.)		
Boulder, Colo.	0.0	0.0
Greeley, Colo.	0.0	0.0
Ft. Pierce, Fla.	0.0	0.0

MONTHLY MOTOR VEHICLE DEATHS AND TRAFFIC TRENDS 1959-1960



CHANGES IN MOTOR-VEHICLE DEATHS
FIRST 9 MONTHS, 1959 TO 1960



MOTOR VEHICLE DEATHS AND CHANGES

Months	DEATHS				PERCENTAGE CHANGES				
					Corresponding Month			4 Mos. Mov. Ave.*	
	1956	1958	1959	1960	1956-1960	1958-1959	1959-1960	1958-1959	1959-1960
January	2,954	2,709	2,790	2,850	— 2%		+ 2%		0%
February	2,652	2,398	2,430	2,380	—10%		— 2%		0%
March	2,940	2,598	2,860	2,400	—18%		—16%		— 3%
April	2,970	2,595	2,650	2,910	— 2%		+10%		— 2%
May	3,094	2,937	3,110	3,230	+ 3%		+ 4%		— 1%
June	3,338	3,078	3,260	3,320	0%		+ 2%		0%
July	3,555	3,098	3,250	3,450	— 3%		+ 6%		+ 5%
August	3,535	3,550	3,510	3,470	— 2%		— 1%		+ 3%
September	3,653	3,325	3,360	3,430	— 6%		+ 2%		+ 2%
9 Months	28,691	26,288	27,220	27,440	— 4%		+ 1%		
October	3,476	3,586	3,440			— 4%		0%	
November	3,603	3,526	3,490			— 1%		— 1%	
December	3,858	3,581	3,650			+ 2%		— 1%	
Total	39,628	36,981	37,800						

All 1956 and 1958 figures are from the National Office of Vital Statistics. The 1959 and 1960 figures are National Safety Council estimates.

The 1960 national estimate is arrived at by assuming that the percentage change from 1959 to 1960 in the states reporting for both years reflects the 1959-1960 change in the entire country. First reports are preliminary, so revisions are made from time to time as later reports are received for the various months. Thus, figures above for 1960 may differ slightly from figures for the same months which will be published in future issues of TRAFFIC SAFETY.

*Four Months Moving Average is based on changes between the totals for four months instead of one month. For example, the September figure shows the change between the totals for June-September 1959 and June-September 1960, etc. Adding several months together tends to smooth out single month changes which may be affected by the differences in the number of weekends in a month from one year to the next, random variations, etc.

TRAFFIC DEATHS—CITY RECORDS

The table covers only motor-vehicle deaths resulting from traffic accidents that occurred in the city. Nontraffic motor vehicle deaths (where the accident occurred on home or work premises) are not included; nor are deaths in the city from accidents occurring outside.

Rankings are based on the 1960 registration death rate which is the number of deaths per 10,000 registered motor vehicles on an annual basis. Vehicle registration figures are for the year 1959 and were supplied by R. L. Polk & Co.

Cities are ranked by registration death rates—from low to high. When two or more cities have exactly the same rate, ranking is by total vehicle registrations—from large to small.

Cities shown in heavy type have improved in 1960 compared with 1959.

The population death rate is the number of deaths per 100,000 population on an annual basis. Populations are as of April, 1950, or later censuses taken by the U. S. Bureau of the Census.

	Nine Months 1960	1959	1958	1960 Reg. Rate	1960 Pop. Rate
ALL REPORTING CITIES				2.2	8.9
Group I (1,000,000 and Over)					
1. Chicago, Ill.	185	212	216	2.5	6.6
2. Detroit, Mich.	141	122	106	2.9	9.8
3. Los Angeles, Calif.	276	236	254	3.0	16.4
All cities in this group				3.2	8.6
4. Philadelphia, Pa.	131	102	122	3.4	8.4
5. New York, N. Y.	414	505	437	4.0	7.1
Group II (750,000 to 1,000,000)					
1. St. Louis, Mo.	55	59	41	2.4	8.6
2. San Francisco, Calif.	60	63	47	2.7	10.3
All cities in this group				2.9	9.6
3. Cleveland, Ohio	70	65	64	3.2	10.1
4. Washington, D. C.	59	42	39	3.5	9.4
Group III (500,000 to 750,000)					
1. Seattle, Wash.	29	39	49	1.3	6.7
2. Milwaukee, Wis.	34	33	26	1.4	6.4
3. Houston, Tex.	57	82	64	1.8	10.7
4. Buffalo, N. Y.	38	30	40	2.2	8.5
All cities in this group				2.3	9.5
5. Minneapolis, Minn.	39	24	31	2.6	10.0
6. Boston, Mass.	34	48	40	2.7	6.3
7. Dallas, Tex.	64	49	52	2.8	14.7
8. Cincinnati, Ohio	48	38	36	2.9	11.1
9. Pittsburgh, Pa.	44	35	48	2.9	8.6
10. San Diego, Calif.	51	57	65	3.4	13.6
Group IV (350,000 to 500,000)					
1. Oakland, Calif.	23	39	33	2.0	8.0
2. Denver, Colo.	42	41	30	2.0	11.8
3. Portland, Ore.	43	36	27	2.4	13.9
4. Indianapolis, Ind.	41	29	21	2.5	11.8
5. Columbus, Ohio	32	25	34	2.5	8.9
6. Birmingham, Ala.	27	37	27	2.5	10.0
All cities in this group				2.7	11.7
7. Memphis, Tenn.	37	25	22	2.8	10.1
8. Louisville, Ky.	34	33	35	2.9	11.1
9. San Antonio, Tex.	48	36	37	3.0	14.1
10. Atlanta, Ga.	45	59	50	3.2	12.2
11. Phoenix, Ariz.	49	35	23	3.5	15.2
12. Kansas City, Mo.	48	39	27	4.1	13.3
Group V (200,000 to 350,000)					
1. Wichita, Kan.	7	7	11	0.7	4.2
2. Grand Rapids, Mich.	7	13	15	0.8	4.4
3. Miami, Fla.	19	31	32	1.2	9.8
4. Rochester, N. Y.	16	6	15	1.5	6.2
5. Syracuse, N. Y.	9	9	9	1.6	5.6
6. Omaha, Neb.	14	23	17	1.6	6.7
7. Norfolk, Va.	11	10	15	1.6	5.0
8. Akron, Ohio	17	23	34	1.8	7.4
9. Toledo, Ohio	22	12	13	1.9	8.5
10. Dayton, Ohio	22	16	16	1.9	9.8
All cities in this group				2.0	9.7
11. Fort Worth, Tex.	26	25	22	2.1	10.5
12. Tampa, Fla.	24	23	20	2.3	11.9
13. Worcester, Mass.	10	17	8	2.3	6.6
14. Richmond, Va.	21	17	19	2.4	11.8
15. Flint, Mich.	20	9	10	2.4	12.4
16. Honolulu, Hawaii	28	33	19	2.5	15.0
17. Oklahoma City, Okla.	37	21	19	2.7	17.3
18. Long Beach, Calif.	32	20	25	2.7	12.7
19. Jacksonville, Fla.	33	19	31	2.8	17.6
20. El Paso, Tex.	20	28	36	3.1	10.7
Group VI (100,000 to 200,000)					
1. Wilmington, Del.	3	5	8	0.7	3.6
2. Saginaw, Mich.	3	3	3	0.7	3.7
3. Yonkers, N. Y.	3	2	3	0.7	2.2
4. Berkeley, Calif.	3	8	7	0.8	3.4
5. Baton Rouge, La.	5	14	14	0.9	4.4
6. Lansing, Mich.	4	6	6	0.9	4.8
7. Madison, Wis.	4	5	5	1.0	4.8
8. Lincoln, Neb.	4	2	2	1.1	4.5
9. Fresno, Calif.	7	11	7	1.1	7.6
10. Erie, Pa.	6	4	5	1.2	5.8
11. Springfield, Mass.	6	6	12	1.3	4.8
12. Elizabeth, N. J.	4	5	8	1.4	4.5
13. Dearborn, Mich.	8	8	22	1.4	8.2
14. Niagara Falls, N. Y.	4	3	5	1.4	5.2
15. Glendale, Calif.	6	9	4	1.4	7.0
16. Austin, Tex.	8	14	5	1.4	6.5
17. Evansville, Ind.	7	11	6	1.5	5.5
18. Montgomery, Ala.	6	5	3	1.5	6.9
19. Arlington, Va.	7	10	3	1.5	5.8
20. Spokane, Wash.	11	9	11	1.6	7.8
21. Gary, Ind.	8	12	10	1.6	6.0
22. Pasadena, Calif.	8	9	9	1.6	9.3
23. Rockford, Ill.	8	3	3	1.6	8.9
24. Canton, Ohio	8	6	6	1.7	8.6
25. Des Moines, Iowa	12	12	14	1.7	8.7
26. Savannah, Ga.	7	9	4	1.7	7.1
27. Hartford, Conn.	8	5	2	1.8	5.7
28. Little Rock, Ark.	7	8	7	1.8	8.7
29. Sacramento, Calif.	15	18	11	1.8	12.7
30. Youngstown, Ohio	9	12	10	1.8	6.5
31. Tacoma, Wash.	12	7	10	1.8	10.2
32. Utica, N. Y.	5	5	4	1.8	6.5
33. Corpus Christi, Tex.	10	4	12	1.9	9.2
34. Salt Lake City, Utah	18	9	16	1.9	12.5
All cities in this group				2.0	9.7
35. Peoria, Ill.	10	2	5	2.1	11.7
36. Amarillo, Tex.	9	6	2	2.1	12.0
37. Fort Wayne, Ind.	14	10	5	2.3	12.2
38. Bridgeport, Conn.	11	7	3	2.4	8.7
39. New Haven, Conn.	10	5	4	2.4	8.0
40. Chattanooga, Tenn.	12	18	16	2.5	12.2
41. Hammond, Ind.	7	12	16	2.5	8.5
42. Allentown, Pa.	9	9	5	2.5	10.7
43. Kansas City, Kan.	14	11	4	2.6	14.4
44. Nashville, Tenn.	17	11	17	2.7	13.0
45. Albuquerque, N. M.	17	24	13	2.7	13.3
46. San Jose, Calif.	23	17	14	2.8	19.3
47. Lubbock, Tex.	12	16	7	2.9	15.2
48. Newport News, Va.	7	2	12	2.9	8.9
49. Waterbury, Conn.	9	3	3	3.1	10.6
50. Duluth, Minn.	10	7	14	3.1	12.6
51. Waco, Tex.	11	9	4	3.1	14.5
52. Shreveport, La.	19	11	7	3.3	15.8
53. Jackson, Miss.	14	9	5	3.3	15.8
54. St. Petersburg, Fla.	27	21	11	3.4	27.1
55. Mobile, Ala.	25	20	15	4.8	19.2
56. Charlotte, N. C.	30	17	13	5.2	25.7
Group VII (50,000 to 100,000)					
1. Schenectady, N. Y.	0	2	4	0.0	0.0
2. Colorado Spgs., Colo.	0	1	3	0.0	0.0
3. Lexington, Ky.	0	5	3	0.0	0.0
4. San Mateo, Calif.	0	2	3	0.0	0.0
5. White Plains, N. Y.	0	3	1	0.0	0.0
6. Elmira, N. Y.	0	1	0	0.0	0.0
7. Medford, Mass.	0	1	1	0.0	0.0
8. Passaic, N. J.	0	2	2	0.0	0.0
9. Topeka, Kan.	1	9	8	0.2	1.6
10. Cedar Rapids, Iowa	1	0	3	0.3	1.7
11. Joliet, Ill.	1	3	6	0.4	2.2
12. Santa Monica, Calif.	1	5	7	0.4	1.7
13. Bethlehem, Pa.	1	1	0	0.4	1.8
14. Mansfield, Ohio	1	2	2	0.5	2.5
15. Mount Vernon, N. Y.	1	3	1	0.5	1.7
16. East Orange, N. J.	1	1	3	0.5	1.5
17. Portsmouth, Va.	1	4	3	0.5	1.6
18. Pueblo, Colo.	2	10	2	0.6	3.2
19. Alexandria, Va.	2	6	3	0.6	3.1
20. Columbus, Ga.	2	9	6	0.7	3.0
21. Meriden, Conn.	1	3	1	0.7	2.6
22. West Allis, Wis.	1	2	4	0.8	2.1
23. Woonsocket, R. I.	1	2	0	0.8	2.6
24. San Leandro, Calif.	2	2	4	0.8	4.2
25. Johnstown, Pa.	2	4	2	0.8	4.2
26. Kenosha, Wis.	2	7	2	0.9	4.1
27. E. St. Louis, Ill.	3	8	9	0.9	4.3
28. Decatur, Ill.	3	8	11	0.9	5.1
29. Evanston, Ill.	2	0	0	0.9	3.5
30. Anderson, Ind.	2	1	2	0.9	5.3
31. St. Clair Shrs., Mich.	2	3	2	0.9	4.3
32. Lakewood, Calif.	2	5	3	1.0	3.7
33. New Rochelle, N. Y.	2	1	2	1.0	3.6
34. Abilene, Tex.	3	6	2	1.1	6.6
35. Hayward, Calif.	3	5	6	1.1	7.3
36. Binghamton, N. Y.	3	2	2	1.1	4.8
37. Newton, Mass.	3	6	5	1.1	4.6
38. Muncie, Ind.	3	6	2	1.1	6.1
39. Torrance, Calif.	4	9	5	1.1	5.5
40. Lakewood, Ohio	2	4	5	1.1	3.8
41. Fort Smith, Ark.	2	8	8	1.1	4.5
42. Richmond, Calif.	3	5	4	1.2	4.0
43. Council Bluffs, Iowa	2	4	4	1.2	5.0
44. Euclid, Ohio	2	1	5	1.2	4.3
45. Lynchburg, Va.	2	3	9	1.3	5.0
46. Muskegon, Mich.	3	2	2	1.3	7.0
47. Springfield, Ohio	4	6	4	1.3	6.0
48. Aurora, Ill.	3	1	2	1.3	6.9
49. Sioux Falls, S. D.	3	4	1	1.3	6.7
50. Pittsfield, Mass.	2	2	3	1.3	4.8
51. Bloomfield, N. J.	2	1	0	1.3	5.3
52. Columbia, S. C.	5	5	1	1.4	6.9
53. Lake Charles, La.	3	3	5	1.4	7.1
54. Hamilton, Ohio	4	3	4	1.4	7.3
55. Orlando, Fla.	8	6	0	1.4	11.9
56. Cambridge, Mass.	3	2	6	1.4	4.0
57. Pensacola, Fla.	4	4	2	1.4	10.5
58. Springfield, Ill.	5	3	4	1.5	8.2
59. Pawtucket, R. I.	3	5	1	1.5	4.6
60. Terre Haute, Ind.	4	1	4	1.5	7.3
61. W. Hartford, Conn.	2	3	0	1.5	4.6
62. Wilkes-Barre, Pa.	4	2	4	1.5	6.9
63. Davenport, Iowa	4	5	2	1.5	6.6
64. Sioux City, Iowa	4	14	5	1.6	6.0
65. Santa Ana, Calif.	6	6	0	1.6	11.5
66. Beaumont, Tex.	6	15	6	1.6	8.5
67. Reno, Nev.	4	2	3	1.6	10.2
68. Jackson, Mich.	4	4	1	1.6	8.7
69. Wheeling, W. Va.	3	2	6	1.7	6.8
70. Fullerton, Calif.	3	3	0	1.7	7.9
All cities in this group				1.7	8.0
71. Royal Oak, Mich.	5	11	1	1.8	9.3
72. Asheville, N. C.	4	2	2	1.8	10.1
73. Stamford, Conn.	5	4	3	1.8	7.6
74. Charleston, W. Va.	4	9	4	1.8	7.3
75. Irvington, N. J.	3	1	0	1.8	6.4
76. Dubuque, Iowa	3	0	0	1.8	7.8
77. Tuscaloosa, Ala.	3	6	2	1.9	7.0
78. Portland, Maine	4	1	5	1.9	6.6
79. Burbank, Calif.	7	9	7	1.9	10.3
80. Lwr. Merion Twp., Pa.	3	2	1	2.0	6.9
81. Alameda, Calif.	4	4	1	2.0	7.4
82. Greensboro, N. C.	6	7	16	2.0	9.8
83. Waterloo, Iowa	5	4	5	2.0	9.5
84. Warren, Ohio	5	5	2	2.0	10.6
85. Cuyahoga Falls, Ohio	3	1	2	2.0	7.9
86. Parma, Ohio	3	0	1	2.0	5.4
87. Fort Lauderdale, Fla.	8	2	4	2.0	16.9
88. San Bernardino, Calif.	9	14	14	2.1	14.4
89. Pontiac, Mich.	7	5	13	2.1	11.2
90. Miami Beach, Fla.	5	6	5	2.1	13.1
91. Hampton, Va.	4	5	14	2.1	6.6
92. Racine, Wis.	6	1	2	2.1	9.8
93. Waltham, Mass.	3	3	2	2.2	8.0
94. Bay City, Mich.	5	3	1	2.2	11.0
95. St. Joseph, Mo.	5	5	2	2.2	8.5
96. Durham, N. C.	6	8	5	2.3	11.2
97. Oak Park, Ill.	4	0	1	2.3	8.7
98. W. Palm Beach, Fla.	7	3	4	2.3	18.3
99. Augusta, Ga.	6	4	4	2.3	10.7
100. Ann Arbor, Mich.	5	1	3	2.3	12.2
101. Lancaster, Pa.	6	2	2	2.3	11.8
102. Riverside, Calif.	8	7	5	2.4	14.1
103. Warren, Mich.	6	10	5	2.4	12.6
104. Bayonne, N. J.	4	1	2	2.4	6.9
105. New Britain, Conn.	5	3	5	2.5	7.6
106. Compton, Calif.	7	7	10	2.7	14.6
107. Lincoln Park, Mich.	4	2	3	2.7	9.9

	Nine Months 1960	1959	1958	1960 Reg. Rate	1960 Pop. Rate
108. Battle Creek, Mich...	6	2	2	2.8	14.6
109. Wichita Falls, Tex.....	8	7	4	2.8	11.8
110. Anaheim, Calif.	**11**	**18**	**2**	**3.0**	**18.7**
111. Kalamazoo, Mich.	9	2	4	3.0	16.0
112. San Angelo, Tex.....	6	4	2	3.1	14.6
113. Stockton, Calif.	13	11	10	3.1	22.7
114. East Chicago, Ind.....	4	1	3	3.1	8.9
115. Manchester, N. H.....	7	5	3	3.1	10.6
116. Greenville, S. C.....	8	4	2	3.2	16.4
117. Brockton, Mass.	**6**	**7**	**6**	**3.4**	**12.8**
118. Tucson, Ariz.	14	12	6	3.4	26.7
119. Springfield, Mo.	11	4	3	3.5	18.4
120. Santa Barbara, Calif.	10	5	6	3.5	23.9
121. Gadsden, Ala.	5	3	3	3.6	10.4
122. Atlantic City, N. J...	5	5	7	3.7	10.8
123. Covington, Ky.	7	2	3	3.8	37.9
124. Charleston, S. C.....	6	0	4	3.9	11.4
125. Ogden, Utah	11	5	6	3.9	22.5
126. Brookline, Mass.	5	2	5	3.9	11.7
127. Norwalk, Conn.	6	4	6	4.0	13.1
128. Las Vegas, Nev.....	14	5	2	4.6	35.2
129. Greenwich, Conn.	6	5	1	5.2	15.5

Group VIII (25,000 to 50,000)

1. Whittier, Calif.	**0**	**1**	**0**	**0.0**	**0.0**
2. Plainfield, N. J.....	0	0	2	0.0	0.0
3. Appleton, Wis.	**0**	**4**	**0**	**0.0**	**0.0**
4. Salina, Kan.	0	2	1	0.0	0.0
5. University City, Mo.	**0**	**1**	**2**	**0.0**	**0.0**
6. Highland Pk., Mich.	**0**	**6**	**3**	**0.0**	**0.0**
7. Eau Claire, Wis.	**0**	**2**	**2**	**0.0**	**0.0**
8. Stratford, Conn.	**0**	**2**	**2**	**0.0**	**0.0**
9. Marion, Ohio	**0**	**2**	**4**	**0.0**	**0.0**
10. Portsmouth, Ohio	**0**	**1**	**2**	**0.0**	**0.0**
11. Montebello, Calif.	**0**	**1**	**2**	**0.0**	**0.0**
12. Granite City, Ill.	**0**	**2**	**1**	**0.0**	**0.0**
13. Wausau, Wis.	**0**	**2**	**1**	**0.0**	**0.0**
14. Galesburg, Ill.	**0**	**4**	**2**	**0.0**	**0.0**
15. Ferndale, Mich.	**0**	**1**	**2**	**0.0**	**0.0**
16. Sandusky, Ohio	**0**	**2**	**4**	**0.0**	**0.0**
17. Manhattan Bch., Calif.	0	0	0	0.0	0.0
18. Findlay, Ohio	**0**	**3**	**2**	**0.0**	**0.0**
19. Fair Lawn, N. J.	**0**	**1**	**2**	**0.0**	**0.0**
20. Park Hill, S. C.	**0**	**3**	**2**	**0.0**	**0.0**
21. Fond du Lac, Wis. ...	**0**	**1**	**2**	**0.0**	**0.0**
22. Park Ridge, Ill.....	0	0	1	0.0	0.0
23. Columbia, Mo.	**0**	**2**	**0**	**0.0**	**0.0**
24. Steubenville, Ohio	**0**	**2**	**2**	**0.0**	**0.0**
25. Lockport, N. Y.....	0	0	2	0.0	0.0
26. Walla Walla, Wash.	0	0	2	0.0	0.0
27. Birmingham, Mich. ..	0	0	0	0.0	0.0
28. Minot, N. D.	**0**	**2**	**0**	**0.0**	**0.0**
29. Mt. Clemens, Mich...	0	0	2	0.0	0.0
30. Norman, Okla.	**0**	**2**	**1**	**0.0**	**0.0**
31. Middletown, Conn. ..	**0**	**2**	**4**	**0.0**	**0.0**
32. Burlington, Vt.	**0**	**2**	**0**	**0.0**	**0.0**
33. New Kensington, Pa.	**0**	**2**	**0**	**0.0**	**0.0**
34. Annapolis, Md.	**0**	**1**	**2**	**0.0**	**0.0**
35. Oak Ridge, Tenn.	**0**	**2**	**2**	**0.0**	**0.0**
36. Denton, Tex.	**0**	**3**	**0**	**0.0**	**0.0**
37. Wallingford, Conn. ..	**0**	**3**	**3**	**0.0**	**0.0**
38. Maple Heights, Ohio	**0**	**1**	**0**	**0.0**	**0.0**
39. Winona, Minn.	0	0	1	0.0	0.0
40. East Lansing, Mich..	**0**	**4**	**2**	**0.0**	**0.0**
41. Park Forest, Ill.....	0	0	0	0.0	0.0
42. Belmont, Mass.	**0**	**1**	**0**	**0.0**	**0.0**
43. Lackawanna, N. Y...	0	0	1	0.0	0.0
44. Palo Alto, Calif.	**1**	**4**	**0**	**0.4**	**2.8**
45. Eugene, Ore.	**1**	**3**	**2**	**0.4**	**2.9**
46. Tyler, Tex.	**1**	**5**	**1**	**0.5**	**2.9**
47. Redwood City, Calif.	1	1	2	0.5	3.4
48. Vancouver, Wash.	1	0	4	0.5	3.2
49. Cheyenne, Wyo.	**1**	**3**	**1**	**0.5**	**3.2**
50. Casper, Wyo.	1	1	0	0.5	3.7
51. Everett, Wash.	**1**	**4**	**1**	**0.6**	**3.8**
52. Beverly Hills, Calif..	**1**	**4**	**1**	**0.6**	**4.4**
53. Wilmington, N. C.	**1**	**4**	**2**	**0.6**	**2.9**
54. Newark, Ohio	1	0	4	0.6	3.3
55. Quincy, Ill.	**1**	**6**	**3**	**0.6**	**3.1**
56. Easton, Pa.	1	1	0	0.7	3.3
57. West Covina, Calif...	1	0	4	0.7	3.8
58. Danbury, Conn.	1	0	2	0.7	3.1
59. Newburgh, N. Y.....	1	0	2	0.7	4.1
60. Fargo, N. D.....	1	0	2	0.7	3.2
61. Alton, Ill.	**1**	**4**	**4**	**0.8**	**4.1**
62. Bloomington, Ind.	**1**	**3**	**0**	**0.8**	**4.4**
63. Barberton, Ohio	1	0	7	0.8	3.7
64. Torrington, Conn.	**1**	**2**	**0**	**0.8**	**4.4**
65. Rome, Ga.	1	1	2	0.8	3.1
66. West Orange, N. J...	**1**	**3**	**4**	**0.8**	**3.9**
67. Mountain View, Calif.	**1**	**2**	**4**	**0.8**	**5.1**
68. Jackson, Tenn.	1	0	1	0.8	3.9
69. Monrovia, Calif.	**1**	**3**	**0**	**0.8**	**5.3**
70. Maywood, Ill.	1	1	1	0.9	4.8
71. South Euclid, Ohio	**1**	**2**	**0**	**0.9**	**4.8**
72. Billings, Mont.	2	2	2	0.9	6.9
73. Westfield, N. J.....	1	0	1	0.9	5.1
74. Baldwin Park, Calif.	**1**	**2**	**2**	**0.9**	**4.1**
75. Mason City, Iowa.....	1	1	2	0.9	4.5

	Nine Months 1960	1959	1958	1960 Reg. Rate	1960 Pop. Rate
76. Oak Park, Mich.....	1	0	0	0.9	4.1
77. Bangor, Maine	**1**	**2**	**2**	**0.9**	**3.3**
78. Allen Park, Mich.	**1**	**2**	**1**	**0.9**	**3.3**
79. Hackensack, N. J.	**1**	**2**	**2**	**0.9**	**4.1**
80. Kearny, N. J.	**1**	**5**	**1**	**0.9**	**3.3**
81. Richfield, Minn.	**1**	**3**	**1**	**0.9**	**3.8**
82. Teaneck, N. J.....	1	1	5	0.9	3.5
83. Vallejo, Calif.	**2**	**7**	**1**	**1.0**	**6.1**
84. Benton Harbor, Mich.	1	1	2	1.0	5.2
85. Redlands, Calif.	1	1	2	1.0	5.2
86. Montclair, N. J.	**1**	**2**	**1**	**1.0**	**3.0**
87. Provo, Utah	1	1	2	1.0	4.0
88. Brownsville, Tex.	1	1	4	1.0	3.6
89. Watertown, Mass.	1	1	0	1.1	3.4
90. Poughkeepsie, N. Y.	2	1	2	1.1	6.5
91. Burlington, N. C.....	1	1	1	1.1	5.3
92. Kokomo, Ind.	**2**	**6**	**3**	**1.1**	**5.8**
93. Hamden, Conn.	**1**	**3**	**2**	**1.1**	**3.5**
94. Lewiston, Maine	1	1	0	1.1	3.2
95. Fairmont, W. Va.....	1	0	0	1.1	4.5
96. Pasadena, Tex.	**2**	**3**	**5**	**1.1**	**5.6**
97. Lafayette, Ind.	2	2	1	1.2	6.6
98. Hutchinson, Kan.	2	1	1	1.2	7.3
99. Urbana, Ill.	1	0	0	1.2	5.1
100. Warwick, R. I.	**2**	**4**	**6**	**1.2**	**6.2**
101. Rapid City, S. D.	**2**	**5**	**2**	**1.3**	**6.7**
102. Rock Island, Ill.	**2**	**6**	**3**	**1.3**	**5.4**
103. Zanesville, Ohio	2	2	1	1.3	5.9
104. Rochester, Minn.	2	0	2	1.3	8.6
105. Pocatello, Idaho	**2**	**3**	**7**	**1.4**	**9.9**
106. Oshkosh, Wis.	2	1	1	1.4	6.1
107. Yakima, Wash.	3	1	3	1.4	9.1
108. Bellingham, Wash. ..	2	0	2	1.4	7.3
109. Danville, Va.	2	1	5	1.4	5.4
110. Ontario, Calif.	3	1	3	1.4	9.6
111. Great Falls, Mont....	3	2	4	1.5	8.6
112. Beloit, Wis.	2	1	2	1.5	8.4
All cities in this group				1.5	7.5
113. Des Plaines, Ill.....	2	1	2	1.6	8.7
114. East Hartford, Conn.	**2**	**5**	**4**	**1.6**	**7.1**
115. Boise, Idaho	3	0	0	1.6	11.6
116. Linden, N. J.....	2	1	5	1.6	7.3
117. Roseville, Mich.	**2**	**5**	**2**	**1.6**	**6.4**
118. Groton, Conn.	1	1	1	1.6	4.9
119. Manchester, Conn ..	**2**	**3**	**2**	**1.6**	**6.7**
120. Clearwater, Fla.	3	3	4	1.7	13.7
121. Fairfield, Conn.	**2**	**7**	**4**	**1.7**	**6.5**
122. Bloomington, Ill.	2	1	1	1.7	7.4
123. Burlington, Iowa	2	0	2	1.7	8.7
124. Midland, Tex.	4	1	3	1.8	14.6
125. Odessa, Tex.	4	4	1	1.9	12.0
126. Spartanburg, S. C. ..	**3**	**6**	**2**	**1.9**	**9.6**
127. Owensboro, Ky.	3	1	1	1.9	9.3
128. Manitowoc, Wis.	2	0	3	1.9	8.9
129. St. Cloud, Minn.....	2	2	2	1.9	8.3
130. Hamtramck, Mich.	2	1	2	1.9	5.8
131. Tallahassee, Fla.	4	0	4	1.9	19.5
132. La Crosse, Wis.....	3	3	2	2.0	8.4
133. Bristol, Conn.	2	0	1	2.0	5.9
134. Hagerstown, Md.	3	2	1	2.0	10.4
135. Enid, Okla.	3	2	1	2.0	10.8
136. Rahway, N. J.....	2	1	1	2.0	9.9
137. Aurora, Colo.	3	0	1	2.0	16.0
138. Sumter, S. C.	**2**	**3**	**2**	**2.1**	**10.6**
139. Garfield Hgts., Ohio	2	1	6	2.1	7.6
140. Sheboygan, Wis.	3	0	0	2.1	8.4
141. St. Louis Pk., Minn.	3	2	0	2.1	10.4
142. Freeport, Ill.	2	1	1	2.1	10.4
143. Coral Gables, Fla.....	3	2	5	2.2	13.7
144. Amsterdam, N. Y.....	2	1	2	2.2	8.1
145. East Detroit, Mich.....	3	2	0	2.2	9.3
146. Grand Forks, N. D.	2	0	0	2.3	9.4
147. Arlington, Mass.	3	1	0	2.3	8.5
148. Ventura, Calif.	3	3	3	2.3	15.4
149. Shaker Heights, Ohio	2	0	5	2.3	7.9
150. Wyoming, Mich.	**3**	**5**	**2**	**2.3**	**9.3**
151. East Cleveland, Ohio	3	1	1	2.4	9.9
152. Chicopee, Mass.	**3**	**4**	**1**	**2.4**	**8.1**
153. Elkhart, Ind.	4	0	1	2.4	13.8
154. Janesville, Wis.	3	2	2	2.5	12.5
155. Hazel Park, Mich.....	2	0	2	2.5	10.0
156. Kankakee, Ill.	3	2	0	2.5	14.1
157. Daytona Beach, Fla...	**4**	**5**	**3**	**2.6**	**14.7**
158. Elyria, Ohio	4	0	0	2.6	14.1
159. Moline, Ill.	4	4	6	2.6	13.6
160. Pine Bluff, Ark.....	4	1	1	2.6	13.4
161. Modesto, Calif.	5	0	6	2.7	19.7
162. Champaign, Ill.	4	1	2	2.7	11.0
163. Muskogee, Okla.	**4**	**5**	**2**	**2.8**	**14.3**
164. Iowa City, Iowa.....	3	1	0	3.0	14.7
165. Middletown, Ohio	5	3	4	3.1	15.1
166. West Haven, Conn...	4	1	2	3.2	14.3
167. Michigan City, Ind...	4	0	3	3.2	16.1
168. Concord, N. H.....	3	3	3	3.2	13.4
169. Lawton, Okla.	5	4	2	3.3	17.1
170. Port Huron, Mich.....	5	3	2	3.3	17.3
171. Norwich, Conn.	4	1	0	3.3	13.7
172. Livonia, Mich.	6	3	2	3.3	16.4
173. Wauwatosa, Wis.	5	1	2	3.4	14.4
174. Elgin, Ill.	6	2	4	3.4	16.6

	Nine Months 1960	1959	1958	1960 Reg. Rate	1960 Pop. Rate
175. National City, Calif.	4	2	2	3.7	16.8
176. Fitchburg, Mass.	4	3	1	3.7	12.4
177. Chula Vista, Calif.....	6	1	3	3.8	22.5
178. Elmhurst, Ill.	5	1	2	3.8	19.2
179. Watertown, N. Y.....	4	4	1	3.9	14.9
180. Vineland, N. J.....	5	3	4	3.9	20.2
181. Kettering, Ohio	4	0	0	4.1	11.0
182. New London, Conn.	4	2	3	4.1	17.1
183. Temple, Tex.	4	4	2	4.1	17.7
184. Milford, Conn.	5	0	1	4.4	17.0
185. Santa Fe, N. M.....	5	0	2	4.7	22.8
186. Revere, Mass.	4	2	3	4.9	13.5
187. Chicago Heights, Ill.	6	0	2	4.9	27.7
188. Monroe, Mich.	6	0	0	5.4	28.6
189. Mishawaka, Ind.	7	1	0	5.6	27.4
190. Fremont, Calif.	4	4	4	5.9	19.9
191. High Point, N. C....	10	1	4	6.2	30.3
192. Highland Park, Ill....	5	2	1	6.4	26.5
193. Superior, Wis.	6	2	1	6.8	22.7
194. Southfield, Mich.	7	2	4	8.7	34.9

Group IX (10,000 to 25,000)

1. Boulder, Colo.	0	0	0	0.0	0.0
2. Greeley, Colo.	**0**	**1**	**0**	**0.0**	**0.0**
3. Ft. Pierce, Fla.	**0**	**7**	**4**	**0.0**	**0.0**
4. Medford, Ore.	**0**	**2**	**0**	**0.0**	**0.0**
5. Merced, Calif.	**0**	**3**	**2**	**0.0**	**0.0**
6. Los Altos, Calif.	**0**	**2**	**0**	**0.0**	**0.0**
7. Edina, Minn.	0	0	0	0.0	0.0
8. Longview, Wash.	**0**	**2**	**3**	**0.0**	**0.0**
9. Bartlesville, Okla.	0	0	3	0.0	0.0
10. Lake Worth, Fla.	**0**	**1**	**2**	**0.0**	**0.0**
11. Sherman, Tex.	**0**	**1**	**1**	**0.0**	**0.0**
12. Butler, Pa.	0	0	1	0.0	0.0
13. Endicott, N. Y.....	0	0	1	0.0	0.0
14. Ames, Iowa	0	0	1	0.0	0.0
15. El Cerrito, Calif.....	0	0	1	0.0	0.0
16. Covina, Calif.	0	0	1	0.0	0.0
17. Great Bend, Kan.....	0	0	1	0.0	0.0
18. Lombard, Ill.	0	0	0	0.0	0.0
19. Tiffin, Ohio	0	0	0	0.0	0.0
20. Wilmette, Ill.	0	0	2	0.0	0.0
21. North Platte, Neb....	0	0	0	0.0	0.0
22. Fremont, Ohio	**0**	**1**	**0**	**0.0**	**0.0**
23. Plainview, Tex.	**0**	**3**	**0**	**0.0**	**0.0**
24. Salisbury, N. C.	**0**	**2**	**1**	**0.0**	**0.0**
25. Pittsburg, Kan.	**0**	**1**	**0**	**0.0**	**0.0**
26. Muscatine, Iowa	0	0	0	0.0	0.0
27. Westport, Conn.	**0**	**3**	**2**	**0.0**	**0.0**
28. Glendora, Calif.	**0**	**3**	**1**	**0.0**	**0.0**
29. Muskegon Hts., Mich.	**0**	**2**	**0**	**0.0**	**0.0**
30. Hibbing, Minn.	0	0	0	0.0	0.0
31. Richland, Wash.	0	0	1	0.0	0.0
32. Niles, Mich.	**0**	**2**	**1**	**0.0**	**0.0**
33. Marietta, Ohio	**0**	**1**	**1**	**0.0**	**0.0**
34. Albert Lea, Minn.	**0**	**2**	**0**	**0.0**	**0.0**
35. Wooster, Ohio	**0**	**3**	**1**	**0.0**	**0.0**
36. Moorhead, Minn.	**0**	**1**	**2**	**0.0**	**0.0**
37. Streator, Ill.	0	0	0	0.0	0.0
38. Las Cruces, N. M....	0	0	2	0.0	0.0
39. Shorewood, Wis.	0	0	2	0.0	0.0
40. Pittsburg, Calif.	0	0	0	0.0	0.0
41. Ashland, Ohio	0	0	1	0.0	0.0
42. Greensburg, Pa.	**0**	**1**	**0**	**0.0**	**0.0**
43. Kennewick, Wash.	**0**	**4**	**0**	**0.0**	**0.0**
44. So. Milwaukee, Wis.	**0**	**1**	**0**	**0.0**	**0.0**
45. Statesville, N. C.....	0	0	3	0.0	0.0
46. Tempe, Ariz.	**0**	**2**	**0**	**0.0**	**0.0**
47. Valparaiso, Ind.	0	0	1	0.0	0.0
48. El Dorado, Kan.	**0**	**1**	**0**	**0.0**	**0.0**
49. Arkansas City, Kan...	**0**	**1**	**0**	**0.0**	**0.0**
50. Escondido, Calif.	**0**	**1**	**0**	**0.0**	**0.0**
51. Evergreen Park, Ill...	0	0	0	0.0	0.0
52. Pasco, Wash.	**0**	**1**	**1**	**0.0**	**0.0**
53. Redding, Calif.	0	0	1	0.0	0.0
54. Takoma Park, Md.	**0**	**1**	**0**	**0.0**	**0.0**
55. McAlester, Okla.	**0**	**1**	**1**	**0.0**	**0.0**
56. Alpena, Mich.	**0**	**3**	**0**	**0.0**	**0.0**
57. Massena, N. Y.	**0**	**1**	**2**	**0.0**	**0.0**
58. Brookfield, Ill.	0	0	0	0.0	0.0
59. Tracy, Calif.	0	0	0	0.0	0.0
60. Owatonna, Minn.	0	0	0	0.0	0.0
61. Prescott, Ariz.	0	0	1	0.0	0.0
62. Wisconsin Rpds., Wis.	0	0	0	0.0	0.0
63. Faribault, Minn.	**0**	**1**	**1**	**0.0**	**0.0**
64. Glenview, Ill.	0	0	1	0.0	0.0
65. Vernon, Conn.	0	0	1	0.0	0.0
66. Boone, Iowa	**0**	**1**	**0**	**0.0**	**0.0**
67. Fergus Falls, Minn...	0	0	0	0.0	0.0
68. South Orange, N. J.	**0**	**1**	**1**	**0.0**	**0.0**
69. Astoria, Ore.	**0**	**1**	**0**	**0.0**	**0.0**
70. Winfield, Kan.	**0**	**1**	**0**	**0.0**	**0.0**
71. Kenmore, N. Y.....	0	0	0	0.0	0.0
72. State College, Pa.....	0	0	0	0.0	0.0
73. Waynesboro, Va.	0	0	0	0.0	0.0
74. Hawthorne, N. J.....	0	0	0	0.0	0.0
75. Moses Lake, Wash.....	0	0	1	0.0	0.0
76. Albany, Calif.	**0**	**1**	**1**	**0.0**	**0.0**
77. Lamesa, Tex.	**0**	**1**	**0**	**0.0**	**0.0**

	Nine Months 1960	1959	1958	1960 Reg. Rate	1960 Pop. Rate
78. Jennings, Mo.	0	0	0	0.0	0.0
79. Enfield, Conn.	0	0	0	0.0	0.0
80. Canton, Ill.	**0**	**2**	**0**	**0.0**	**0.0**
81. Mitchell, S. D.	0	0	0	0.0	0.0
82. Beaver Dam, Wis.	0	0	0	0.0	0.0
83. Hopewell, Va.	**0**	**2**	**0**	**0.0**	**0.0**
84. Conneaut, Ohio	**0**	**1**	**0**	**0.0**	**0.0**
85. Galion, Ohio	0	0	1	0.0	0.0
86. Winnetka, Ill.	**0**	**1**	**0**	**0.0**	**0.0**
87. N. College Hill, Ohio	**0**	**1**	**0**	**0.0**	**0.0**
88. North Olmsted, Ohio	0	0	1	0.0	0.0
89. Mt. Pleasant, Mich.	0	0	1	0.0	0.0
90. Van Wert, Ohio	0	0	0	0.0	0.0
91. Bellefontaine, Ohio	0	0	0	0.0	0.0
92. Elizabeth City, N. C.	**0**	**1**	**1**	**0.0**	**0.0**
93. Bowling Green, Ohio	**0**	**1**	**1**	**0.0**	**0.0**
94. Northbrook, Ill.	0	0	0	0.0	0.0
95. Hornell, N. Y.	0	0	0	0.0	0.0
96. Virginia, Minn.	0	0	0	0.0	0.0
97. Grosse Pt. Wds., Mich.	0	0	0	0.0	0.0
98. Du Bois, Pa.	**0**	**2**	**0**	**0.0**	**0.0**
99. Bay Village, Ohio	0	0	1	0.0	0.0
100. Cudahy, Wis.	0	0	1	0.0	0.0
101. Pacific Grove, Calif.	0	0	0	0.0	0.0
102. University Hts., Ohio	**0**	**1**	**0**	**0.0**	**0.0**
103. Charles City, Iowa	0	0	0	0.0	0.0
104. Fairfield, Calif.	0	0	0	0.0	0.0
105. Menominee, Mich.	0	0	1	0.0	0.0
106. Grosse Pte. Pk., Mich.	0	0	0	0.0	0.0
107. Swampscott, Mass.	0	0	0	0.0	0.0
108. Covington, Va.	0	0	0	0.0	0.0
109. Los Alamos, N. M.	**0**	**2**	**0**	**0.0**	**0.0**
110. Moscow, Idaho	0	0	0	0.0	0.0
111. Mansfield, Conn.	**0**	**1**	**0**	**0.0**	**0.0**
112. Bellaire, Ohio	0	0	1	0.0	0.0
113. Stonington, Conn.	**0**	**1**	**0**	**0.0**	**0.0**
114. Webster, Mass.	0	0	0	0.0	0.0
115. Fairfield, Ala.	0	0	0	0.0	0.0
116. Watertown, Conn.	**0**	**1**	**0**	**0.0**	**0.0**
117. Killingly, Conn.	**0**	**2**	**0**	**0.0**	**0.0**
118. Mercedes, Tex.	**0**	**1**	**0**	**0.0**	**0.0**

	Nine Months 1960	1959	1958	1960 Reg. Rate	1960 Pop. Rate
119. Donora, Pa.	0	0	0	0.0	0.0
120. Englewood, Colo.	1	0	1	0.7	5.8
121. Grand Isle, Neb.	1	1	2	0.9	5.3
122. Austin, Minn.	1	0	1	0.9	5.5
123. Orange, Calif.	1	1	2	0.9	6.2
124. Lawrence, Kan.	1	0	1	1.0	5.7
125. Lodi, Calif.	1	0	1	1.0	6.6
126. Port Chester, N. Y.	1	0	1	1.0	5.4
127. Carlsbad, N. M.	**1**	**2**	**1**	**1.0**	**6.8**
128. Pampa, Tex.	1	0	2	1.1	7.0
129. Ypsilanti, Mich.	1	0	1	1.1	5.8
130. Corvallis, Ore.	1	0	1	1.2	7.2
131. Manhattan, Kan.	1	0	0	1.2	7.0
132. Wheaton, Ill.	1	0	1	1.2	5.6
133. Renton, Wash.	1	1	1	1.2	7.9
134. Uniontown, Pa.	1	0	1	1.2	6.3
135. Ottawa, Ill.	**1**	**2**	**2**	**1.2**	**6.8**
136. Borger, Tex.	**1**	**3**	**1**	**1.2**	**7.3**
137. Jeffersonville, Ind.	**1**	**2**	**1**	**1.2**	**6.7**
138. Madison Hts., Mich.	**1**	**2**	**0**	**1.2**	**6.2**
139. Aberdeen, S. D.	1	1	2	1.3	6.0
140. Denison, Tex.	**1**	**2**	**2**	**1.3**	**6.4**
141. Owosso, Mich.	1	0	1	1.3	6.7
142. Sedalia, Mo.	**1**	**3**	**0**	**1.3**	**6.3**
143. Morristown, N. J.	1	0	0	1.3	7.5
144. Cranford, N. J.	1	1	0	1.3	5.8
145. Robbinsdale, Minn.	1	0	3	1.3	8.2
146. Brownwood, Tex.	**1**	**3**	**1**	**1.3**	**6.6**
147. Texarkana, Ark.	1	1	2	1.3	6.8
148. Cape Girardeau, Mo.	1	1	0	1.3	6.0
149. So. Portland, Maine	1	0	3	1.3	5.5
150. Oceanside, Calif.	**1**	**3**	**4**	**1.3**	**6.5**
151. Meadville, Pa.	1	0	0	1.4	7.0
152. Hollywood, Fla.	**2**	**4**	**1**	**1.4**	**11.7**
153. Calumet City, Ill.	**1**	**5**	**4**	**1.4**	**5.9**
154. Johnson City, N. Y.	1	0	1	1.4	6.9
155. Chico, Calif.	1	0	1	1.4	10.6
156. Fairborn, Ohio	1	0	1	1.4	7.6
157. Xenia, Ohio	1	1	2	1.4	7.9
158. Connersville, Ind.	1	1	2	1.4	7.5

	Nine Months 1960	1959	1958	1960 Reg. Rate	1960 Pop. Rate
159. Huntington, Ind.	1	0	2	1.4	8.2
160. Snyder, Tex.	1	0	0	1.4	8.9
161. Stillwater, Okla.	1	0	2	1.4	6.6
162. Martinsville, Va.	**1**	**5**	**0**	**1.5**	**7.0**
163. Elmwood Park, Ill.	1	0	1	1.5	5.8
164. Caldwell, Idaho	**1**	**2**	**1**	**1.5**	**11.4**
165. New Bern, N. C.	1	1	1	1.5	7.1
166. Mt. Vernon, Ill.	1	0	1	1.5	8.5
167. Peru, Ind.	**1**	**3**	**0**	**1.5**	**8.8**
All cities in this group				1.5	8.0
168. Brainerd, Minn.	1	1	0	1.6	10.6
169. Newton, Kan.	1	0	1	1.6	10.1
170. Sterling, Ill.	1	1	0	1.6	8.8
171. Santa Cruz, Calif.	2	1	4	1.6	11.7
172. Greenwood, Miss.	1	1	0	1.6	6.9
173. Marquette, Mich.	1	0	0	1.6	7.1
174. Antioch, Calif.	1	0	1	1.6	8.6
175. Villa Park, Ill.	1	0	0	1.6	7.3
176. Collingswood, N. J.	1	1	2	1.6	7.4
177. Fostoria, Ohio	1	0	0	1.6	8.1
178. Stevens Point, Wis.	**1**	**2**	**0**	**1.6**	**7.6**
179. La Grange, Ill.	1	0	0	1.6	9.0
180. De Kalb, Ill.	1	1	0	1.6	8.5
181. East Moline, Ill.	**1**	**2**	**0**	**1.7**	**8.7**
182. La Mesa, Calif.	2	2	1	1.7	11.4
183. Vernon, Tex.	**1**	**2**	**1**	**1.7**	**10.5**
184. Attleboro, Mass.	**1**	**4**	**3**	**1.7**	**5.3**
185. Highland Park, Tex.	1	0	1	1.7	10.9
186. Salinas, Calif.	2	1	5	1.7	12.7
187. Norfolk, Neb.	**1**	**2**	**0**	**1.7**	**10.5**
188. Rocky River, Ohio	1	1	0	1.7	8.5
189. Needham, Mass.	1	1	2	1.8	6.2
190. The Dalles, Ore.	1	1	0	1.8	11.8
191. Port Angeles, Wash.	1	0	0	1.8	11.4
192. Garden City, Kan.	1	0	0	1.8	12.2
193. Shelton, Conn.	1	1	5	1.8	8.0
194. Hanford, Calif.	1	0	0	1.8	13.3
195. North Adams, Mass.	**1**	**2**	**0**	**1.8**	**6.2**
196. Branford, Conn.	1	1	0	1.8	9.2
197. Ponca City, Okla.	2	1	0	1.9	11.6

TRAFFIC DEATHS—STATE RECORDS

Deaths are reported by state traffic authorities.

All figures are preliminary. To insure proper comparisons, 1959 and 1958 figures cover the same reporting period as those for 1960.

Population Rate: U. S. population rate is the estimated annual number of deaths per 100,000 population, assuming that deaths for the rest of the year will follow the normal seasonal pattern. State population rate is the estimated annual number of deaths per 100,000 population, assuming that the monthly average of deaths will remain at the present average for the rest of the year. Population rates are based on April 1, 1960, preliminary population counts, U. S. Bureau of the Census, Washington, D. C.

States shown in heavy type have improved in 1960 compared with 1959, or showed no change.

Mileage Rate: The number of deaths per 100 million vehicle miles of travel.

(Figures in parenthesis following the 1960 mileage rate indicate the number of months for which the mileage rate is calculated for each state.)

	Months Reported	Deaths Identical Periods 1960	1959	1958	% Change 1959 to 1960	1958 to 1960	1960 Pop. Rate	1960 Mile. Rate	
TOTAL U.S.	9	27,440	27,220	26,288	+ 1%	+ 4%	21.2	5.1	(9)
Ala.	9	620	593	557	+ 5%	+ 11%	25.4	6.8	(7)
Alaska	9	22	18	20	+ 22%	+ 10%	12.9	—	—
Ariz.	**9**	**366**	**376**	**353**	**— 3%**	**+ 4%**	**37.9**	**7.6**	**(8)**
Ark.	**9**	**316**	**330**	**306**	**— 4%**	**+ 3%**	**23.8**	**5.6**	**(8)**
Calif.	9	2,664	2,558	2,526	+ 4%	+ 5%	22.9	5.2	(7)
Colo.	9	328	308	285	+ 6%	+ 15%	25.1	3.9	(4)
Conn.	9	191	170	165	+ 12%	+ 16%	10.1	2.5	(8)
Del.	9	63	56	67	+ 13%	— 6%	19.0	3.3	(6)
D. of C.	9	59	42	39	+ 40%	+ 51%	10.6	3.5	(6)
Fla.	9	903	781	817	+ 16%	+ 11%	24.6	5.8	(7)
Ga.	9	765	730	664	+ 5%	+ 15%	26.1	6.1	(7)
Hawaii	8	69	58	—	+ 19%	—	15.8	—	—
Idaho	8	145	148	174	— 2%	— 17%	32.8	7.2	(7)
Ill.	**9**	**1,179**	**1,252**	**1,279**	**— 6%**	**— 8%**	**15.7**	**3.8**	**(7)**
Ind.	**9**	**788**	**791**	**727**	**— *%**	**+ 8%**	**22.7**	**4.8**	**(8)**
Ia.	**9**	**412**	**473**	**406**	**— 13%**	**+ 1%**	**20.0**	**4.4**	**(8)**
Kan.	**9**	**350**	**433**	**395**	**— 19%**	**— 11%**	**21.4**	**4.7**	**(7)**
Ky.	**9**	**536**	**542**	**559**	**— 1%**	**— 4%**	**23.7**	**6.4**	**(7)**
La.	9	599	467	584	+ 28%	+ 3%	24.7	7.2	(8)
Maine	9	123	101	142	+ 22%	— 13%	17.0	3.6	(8)
Md.	**9**	**395**	**397**	**366**	**— 1%**	**+ 8%**	**17.1**	**4.7**	**(7)**
Mass.	9	408	400	409	+ 2%	— *%	10.6	3.1	(7)
Mich.	9	1,060	1,005	936	+ 5%	+ 13%	18.2	4.4	(8)
Minn.	9	512	449	514	+ 14%	— *%	20.1	4.1	(7)
Miss.	9	469	381	370	+ 23%	+ 27%	28.9	8.0	(8)
Mo.	9	734	676	663	+ 9%	+ 11%	22.8	5.2	(7)
Mont.	**9**	**164**	**177**	**144**	**— 7%**	**+ 14%**	**32.7**	**6.0**	**(7)**
Neb.	9	202	256	236	— 21%	— 14%	19.2	3.4	(7)
Nev.	**9**	**124**	**137**	**102**	**— 9%**	**+ 22%**	**58.5**	**7.8**	**(6)**
N. H.	**9**	**65**	**95**	**68**	**— 32%**	**— 4%**	**14.5**	**3.6**	**(8)**
N. J.	9	551	539	533	+ 2%	+ 3%	12.2	2.9	(7)
N. M.	**9**	**293**	**339**	**284**	**— 14%**	**+ 3%**	**41.4**	**7.3**	**(7)**
N. Y.	**9**	**1,418**	**1,589**	**1,488**	**— 11%**	**— 5%**	**11.3**	**3.8**	**(8)**
N. C.	**9**	**837**	**848**	**737**	**— 1%**	**+ 14%**	**24.6**	**6.2**	**(8)**
N. D.	**9**	**120**	**137**	**109**	**— 12%**	**+ 10%**	**25.5**	**8.6**	**(7)**
Ohio	9	1,393	1,293	1,265	+ 8%	+ 10%	19.2	4.7	(7)
Okla.	**9**	**463**	**467**	**490**	**— 1%**	**— 6%**	**26.8**	**4.7**	**(2)**
Ore.	**9**	**322**	**353**	**310**	**— 9%**	**+ 4%**	**24.4**	**4.7**	**(8)**
Pa.	9	1,208	1,152	1,169	+ 5%	+ 3%	14.3	4.0	(7)
R. I.	**9**	**43**	**63**	**55**	**— 32%**	**— 22%**	**6.8**	**1.8**	**(7)**
S. C.	9	519	463	401	+ 12%	+ 29%	29.3	7.5	(7)
S. D.	9	168	153	185	+ 10%	— 9%	33.1	5.0	(8)
Tenn.	9	574	537	523	+ 7%	+ 10%	21.6	5.2	(7)
Texas	**9**	**1,630**	**1,726**	**1,645**	**— 6%**	**— 1%**	**22.9**	**4.7**	**(7)**
Utah	9	185	142	144	+ 30%	+ 28%	27.8	5.1	(4)
Vt.	9	72	65	58	+ 11%	+ 24%	24.8	6.0	(8)
Va.	9	538	622	611	— 14%	— 12%	18.4	4.4	(8)
Wash.	9	413	383	392	+ 8%	+ 5%	19.5	4.4	(7)
W. Va.	9	251	301	264	— 17%	— 5%	18.1	5.7	(7)
Wis.	9	614	609	600	+ 1%	+ 2%	20.8	4.6	(6)
Wyo.	9	126	131	105	— 4%	+ 20%	51.3	6.9	(6)
P. R.‡	9	259	187	218	+ 39%	+ 19%	14.9	16.5	(7)
V. I.†	7	5	5	3	0%	+ 67%	33.3	—	—
CANADIAN PROVINCES									
Alta.	8	190	152	193	+ 25%	— 2%	24.6	—	—
B. C.	7	141	155	129	— 9%	+ 9%	16.3	—	—
Man.	8	72	90	68	— 20%	+ 6%	12.6	—	—
Sask.	8	70	100	83	— 30%	— 16%	11.9	—	—

*Less than .5%

‡Commonwealth of Puerto Rico

†Virgin Islands

	Nine Months 1960	1959	1958	1960 Reg. Rate	1960 Pop. Rate
198. Garland, Tex.	**2**	**3**	**1**	**1.9**	**12.0**
199. Ansonia, Conn.	1	1	0	1.9	6.8
200. Lexington, N. C.	1	0	3	1.9	9.2
201. Marshfield, Wis.	1	1	4	1.9	9.8
202. Coronado, Calif.	**1**	**3**	**5**	**1.9**	**7.1**
203. Millbrae, Calif.	1	0	2	2.0	8.4
204. Atchison, Kan.	1	1	1	2.0	10.4
205. Waukesha, Wis.	**2**	**3**	**0**	**2.0**	**11.0**
206. Gardner, Mass.	1	1	2	2.0	6.6
207. Martinsburg, W. Va.	1	0	0	2.0	8.1
208. La Porte, Ind.	2	1	3	2.0	11.6
209. Plymouth, Mich.	1	0	0	2.1	12.2
210. Adrian, Mich.	2	0	1	2.1	11.1
211. Suffolk, Va.	1	0	0	2.2	10.7
212. Kingsport, Tenn.	2	0	0	2.3	10.9
213. Marinette, Wis.	**1**	**2**	**1**	**2.3**	**9.4**
214. Winchester, Conn.	1	1	1	2.3	11.2
215. Red Wing, Minn.	1	0	1	2.3	11.8
216. River Forest, Ill.	**1**	**2**	**0**	**2.3**	**12.3**
217. North Miami, Fla.	2	1	0	2.3	11.4
218. River Rouge, Mich.	**1**	**3**	**0**	**2.3**	**6.2**
219. Mesa, Ariz.	3	3	1	2.3	18.3
220. Cadillac, Mich.	1	0	0	2.4	12.8
211. East Haven, Conn.	2	0	0	2.4	14.2
222. Kinston, N. C.	**2**	**3**	**1**	**2.4**	**11.8**
223. La Grange Park, Ill.	1	0	0	2.4	9.9
224. Glastonbury, Conn.	1	0	0	2.5	11.2
225. Henderson, N. C.	1	0	2	2.5	12.1
226. Dyersburg, Tenn.	**1**	**3**	**1**	**2.5**	**12.2**
227. Maumee, Ohio	1	0	0	2.5	13.0
228. Stoughton, Mass.	1	0	3	2.6	9.6
229. Westlake, Ohio	1	1	1	2.6	12.4
230. Holland, Mich.	2	2	2	2.6	13.7
231. Floral Park, N. Y.	2	0	0	2.6	14.8
232. Ada, Okla.	2	0	0	2.6	16.7
233. Auburn, Mass.	1	0	0	2.6	10.7
234. Fort Myers, Fla.	3	1	0	2.7	22.6
235. Ridgefield Pk., N. J.	1	0	0	2.7	9.5
236. La Salle, Ill.	1	0	0	2.8	11.0
237. Greenville, Tex.	2	2	1	2.9	17.2
238. Augusta, Maine	2	2	6	2.9	10.8
239. Hillside, N. J.	2	0	1	2.9	12.7
240. Berkley, Mich.	2	2	0	2.9	11.6
241. Oswego, N. Y.	2	0	1	2.9	11.8
242. Woodland, Calif.	2	1	0	3.1	23.0
243. Bell, Calif.	3	1	0	3.2	21.7
244. Niles, Ohio	**2**	**4**	**0**	**3.3**	**13.7**
245. Defiance, Ohio	2	0	0	3.3	18.5
246. Goshen, Ind.	2	1	1	3.4	20.2
247. Bristol, Va.	2	0	0	3.4	14.9
248. Livermore, Calif.	2	0	0	3.4	21.2
249. Naugatuck, Conn.	**2**	**4**	**0**	**3.4**	**13.6**
250. Wethersfield, Conn.	2	0	1	3.5	15.6
251. Westminster, Calif.	**2**	**9**	**0**	**3.6**	**16.7**
252. Sault Ste. Marie, Mich.	2	2	2	3.6	13.6
253. W. Springfield, Mass.	**3**	**4**	**3**	**3.6**	**17.5**
254. Logan, Utah	2	0	3	3.6	15.9
255. St. Joseph, Mich.	2	0	0	3.8	20.4
256. Escanaba, Mich.	2	1	0	3.9	17.6
257. Cedar Falls, Iowa	3	2	0	4.1	22.3
258. Albion, Mich.	2	0	1	4.2	22.3
259. Southington, Conn.	2	0	2	4.3	15.8
260. Leominster, Mass.	3	1	2	4.4	16.1
261. Ocala, Fla.	4	0	2	4.5	37.3
262. Dover, Ohio	2	1	3	4.5	24.7
263. Circleville, Ohio	2	0	0	4.6	25.4
264. Victoria, Tex.	5	0	0	4.6	29.8
265. Homewood, Ala.	2	1	2	4.7	14.8
266. Cambridge, Md.	2	0	1	4.8	25.7
267. Windham, Conn.	2	0	4	4.9	14.6
268. Two Rivers, Wis.	2	1	0	4.9	23.2
269. Ecorse, Mich.	2	0	0	5.0	14.4
270. Santa Paula, Calif.	3	0	1	5.1	32.8
271. Fort Thomas, Ky.	2	0	1	5.1	15.5
272. Milford, Mass.	2	1	1	5.1	17.1
273. West Lafayette, Ind.	**2**	**3**	**1**	**5.2**	**20.4**
274. Monroe, N. C.	2	2	1	5.2	25.4
275. Klamath Falls, Ore.	5	2	0	5.2	35.1
276. Watertown, Wis.	3	1	1	5.5	30.8
277. Rye, N. Y.	3	1	0	5.6	28.8
278. Griffin, Ga.	3	1	0	5.6	28.6
279. Beacon, N. Y.	2	0	2	5.8	17.8
280. Brawley, Calif.	3	0	2	5.9	29.9
281. Ashland, Wis.	2	0	1	6.3	25.2
282. Goldsboro, N. C.	5	3	2	6.3	31.0
283. Yuma, Ariz.	5	1	0	6.7	52.5
284. Windsor, Conn.	3	2	1	6.7	24.0
285. Pompano Beach, Fla.	4	0	0	6.8	44.4
286. North Chicago, Ill.	3	2	3	7.5	22.2
287. Derby, Conn.	3	0	1	8.3	36.0
288. Lufkin, Tex.	7	1	2	8.4	53.6
289. Reidsville, N. C.	6	0	0	14.0	68.4
290. Darien, Conn.	10	2	0	16.9	84.9
CANADIAN CITIES					
London, Ont.	5	6	3	—	6.6
Toronto, Ont.	76	62	88	—	6.8
Vancouver, B. C.	22	23	20	—	7.3
Hamilton, Ont.	16	14	14	—	8.8
Montreal, Que.	90	89	79	—	10.8

MOTOR VEHICLE DEATHS AND INJURIES BY STATES 1960 and 1959

Forty-four states and the District of Columbia have reported their death and injury experience for one to eight months of 1960.

The table below shows all of the injury data reported by each state, but little information is available on precisely what injuries are included in each state's tabulation.

Differences in the ratio of injuries to deaths probably reflect primarily differences in the extent to which all injuries are reported. Other factors are undoubtedly involved, such as: (1) a few states omit some or all of the injuries in urban accidents; (2) there are large differences between states in the proportion of travel which is in urban area (the injury-death ratio for urban accidents is about four times the ratio for rural accidents).

The question of what injuries are being reported applies with equal force to the per cent change in injuries from 1959 to 1960. Any tightening up of police administration, any emphasis on "get all the injuries" is almost certain to bring about an increase in reported injuries, but probably only in minor ones. Similarly, instructions to "skip the scratches" probably would result in a decrease in recorded cases in many states. Introduction of financial responsibility laws has been observed to increase reported injuries sharply. Even the public's increased claims-consciousness is regarded by many people as an element in the growing number of injuries reported. With such factors operating to destroy comparability, indicated changes in the number of injuries should not be considered as reliable.

Months Reported	Deaths†† 1960	1959	Injuries†† 1960	1959	% Change 1959 to 1960 Deaths	Injuries	1960 Ratio of Injuries to Deaths
TOTAL U.S. **	18,082#	17,909#	796,461	754,906	+ 1#	+ 6	44
Ala. 8	565	534	3,231†	3,100†	+ 6	+ 4	6
Ariz.							
Ark. 8	265	301	2,834	2,284	— 12	+ 24	11
Calif. 7	2,028	1,952	85,827	79,841	+ 4	+ 7	42
Colo.							
Conn. 5	83	88	8,719	8,217	— 6	+ 6	105
Del. 7	44	46	1,499	1,558	— 4	— 4	34
D. of C. 8	54	38	5,195	5,130	+ 42	+ 1	96
Fla. 6	614	532	23,100	20,722	+ 15	+ 11	38
Ga. 8	670	653	12,687	11,661	+ 3	+ 9	19
Idaho 8	145	148	3,205	3,437	— 2	— 7	22
Ill. 7	862	937	56,889	55,626	— 8	+ 2	66
Ind. 1	80	76	2,621	2,775	+ 5	— 6	33
Iowa							
Kan. 4	122	143	4,554	4,355	— 15	+ 5	37
Ky. 8	465	490	10,060	10,277	— 5	— 2	22
La. 8	531	529	5,402†	5,595†	+ *	— 3	10
Maine 8	102	85	4,726	4,232	+ 20	+ 12	46
Md. 6	**269**	**250**	**12,262**	**10,004**	**+ 8**	**+ 23**	**46**
Mass. 4	147	151	32,236	28,471	— 3	+ 13	219
Mich. 8	933	854	55,967	39,254	+ 9	+ 43	60
Minn. 8	440	368	18,364	17,668	+ 20	+ 4	42
Miss. 7	366	298	4,450	4,052	+ 23	+ 10	12
Mo. 8	640	583	8,556	7,905	+ 10	+ 8	13
Mont. 7	120	129	2,190	1,636	— 7	+ 34	18
Neb. 7	135	179	6,112	5,766	— 25	+ 6	45
Nev.							
N. H. 8	59	78	4,085	3,901	— 24	+ 5	69
N. J. 5	285	265	27,332	23,563	+ 8	+ 16	96
N. M. 7	219	255	3,503	3,000	— 14	+ 17	16
N. Y. 7	1,051	1,147	152,542	152,866	— 8	— *	145
N. C. 7	629	640	14,392	13,090	— 2	+ 10	23
N. D. 7	83	94	1,661	1,614	— 12	+ 3	20
Ohio 8	1,220	1,105	51,857	49,606	+ 10	+ 5	43
Okla. 1	41	41	1,308	1,190	0	+ 10	32
Ore. 7	219	245	10,116	10,994	— 11	— 8	46
Pa. 6	731	752	42,322	42,457	— 3	— *	58
R. I. 3	**13**	**19**	**2,277**	**2,014**	**— 32**	**+ 13**	**175**
S. C. 8	449	408	7,895	6,202	+ 10	+ 27	18
S. D. 4	43	54	957	—	— 20	—	22
Tenn. 8	506	471	13,540	10,901	+ 7	+ 24	27
Tex. 8	1,441	1,502	38,359	47,323	— 4	— 19	27
Utah 5	76	68	3,330	2,169	+ 12	+ 54	44
Vt. 8	65	60	1,924	2,052	+ 8	— 6	30
Va. 7	427	462	14,599	14,188	— 8	+ 3	34
Wash. 7	291	285	16,094	16,076	+ 2	+ *	55
W. Va. 8	207	265	4,747	5,170	— 22	— 8	23
Wis. 5	284	264	11,765	11,561	+ 8	+ 2	41
Wyo. 8	106	119	2,127	1,403	— 11	+ 52	20
P. R.‡ 7	224	145	7,302	6,664	+ 54	+ 10	33
V. I.¶ 7	5	5	111	95	0	+ 17	22

†Rural injuries only.

††All figures are preliminary. To insure proper comparisons, 1959 figures cover the same reporting period as those for 1960.

*Less than .5%.

**Death and injury totals cover reports for all months indicated in this column.

#Death totals and changes differ from national figures because those shown here are based on the states and months for which injury data are reported.

‡Commonwealth of Puerto Rico.

¶Virgin Islands.

Library

From Page 6

Resistance Tester. 10pp. 1960. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y. (Department of Scientific and Industrial Research, Road Research Laboratory—Road Note No. 27) Price 32 cents.

Youth Activities

On Target: Youth and Traffic Safety. 1960. 14 pp. Automotive Safety Foundation, 200 Ring Building, Washington, D. C.

(A program for youth based on recommendations of the First and Second Youth Leaders' Seminar on Highway Safety.)

ADDRESSES OF MAGAZINES MENTIONED

AAMVA Bulletin
504 Hill Bldg.
Washington 6, D. C.

American Journal of Public Health
1790 Broadway
New York 19, N. Y.

American Motorist
18 Carlisle St.
Gettysburg, Pa.

American Youth
General Motors Bldg.
Detroit 2, Mich.

Automotive News
2666 Penobscot Bldg.
Detroit 26, Mich.

The British Journal of Industrial Safety
52 Grosvenor Gardens
London, S.W. 1, England

Chicago Traffic Safety Review
20 N. Wacker Dr.
Chicago 6, Ill.

Harpers Magazine
49 E. 33rd St.
New York 16, N. Y.

Journal of Occupational Medicine
28 E. Jackson Blvd.
Chicago 4, Ill.

The Kiwanis Magazine
520 N. Michigan Ave.
Chicago 11, Ill.

Nature
St. Martin's St.
London W.C.2, England

Roads and Streets
22 W. Maple St.
Chicago 10, Ill.

Safety Standards
U. S. Department of Labor
Bureau of Labor Standards
Washington 25, D. C.

Street Engineering
22 W. Maple St.
Chicago 10, Ill.

Traffic Digest & Review
1804 Hinman Ave.
Evanston, Ill.

Author Tweaks John Barleycorn's Nose

IN a recently released book entitled *The Commonsense Book of Drinking,** the author, Leon D. Adams, lambastes many misconceptions the public has been known to harbor about alcoholic beverages — not only about the ingestion of the beverages, but also their use and manufacture. Ole John Barleycorn's face must be a shade redder than his nose since this book was released.

Adams did little to endear himself to all the grandmothers of the country who indulge in a bit of elderberry wine-making. He collapsed the story (probably started by some grandfathers) that grandma's wine had a mule's kick packed in it. He said the wine couldn't be more potent than ordinary table wine, unless Grandma added a MULE (in the form of brandy) to her elderberry squeezings. And he is one who should know for he has a background of over 30 years research and writing on the subject of alcoholic beverages. He founded the Wine Institute and has written *The Commonsense Book of Wine.* He is also the executive secretary of the Society of Medical Friends of Wine.

Although primarily not devoted to the subject of alcohol and traffic safety, the book contains a number of points on the subject which merit special note.

One chapter of the book is devoted to the subject of how much an individual can hold. In this chapter, which most concerns the traffic safety specialist, Mr. Adams takes issue with safety sloganeering, such as "If You Drink, Don't Drive," and suggests it would be better to inform people how long to wait after having so many drinks. One wonders if Mr. Adams has ever tried to tell a four-Martini drinker to wait five hours before driving home. Of course, he does say if you can't wait, let your wife drive or take a taxicab, which in effect means "If You Drink, Don't Drive." We should thank him for proving a point.

In the same chapter an illustration appears which the author calls his "Drinkometer." This pictorial device shows the effects of various drinks on three different body weights, listing the number of drinks and the percentage of alcohol in the blood after ingestion of a specified number. Immediately following this device is a chart which shows the average person's blood alcohol concentration at various body weights after ingestion of from one to eight drinks. Both illustrations are fair guides, providing the reader follows the author's basis for computation and adds the time factor for elimination of alcohol.

Adams is not the first to propose use of a device to calculate blood alcohol concentrations. Others have appeared and are still in evidence from time to time.

All-in-all, the book makes for entertaining and informative reading whether you are a tippler or abstainer.

—Donald C. Lhotka
Traffic Consultant
NSC Traffic Operations

**The Commonsense Book of Drinking.* Leon D. Adams, 200 pages. Published by David McKay Company, Inc., New York, 1960.

Use of Seat Belts on Government Vehicles

Secretary of Labor James P. Mitchell has urged all federal agencies to adopt a Federal Safety Council recommendation that seat belts be used on government-owned motor vehicles.

In a letter to agency heads the Secretary pointed out that the council's recommendation was based on prior study and the experience of agencies which have installed safety belts in their vehicles.

"Vehicle accidents are the greatest single cause of occupational death in the federal service," Mr. Mitchell said, "accounting for 35 fatalities in 1958 at an average cost of $43,800. Direct costs to the government for more than 2,800 traffic injuries to its employes that year were two and a half million dollars.

The Federal Safety Council, representing various Government agencies, advises the Secretary of Labor on safety standards for Federal employees. It recently conducted a symposium on the cost, installation and use of the seat belts at the Department of Labor Auditorium, Washington, D. C.

Top Performers

From Page 33

were encountered. Throughout the entire run there were numerous stretches of highway under construction so the drivers had to be extremely alert. For the last 100 miles, prior to arriving at Las Vegas, the vehicles traveled through open range country in which stray cattle roamed the edges of the highway and, in many cases, crossed the road. The last 50 miles of this stretch of open range country was traveled in the hours of darkness.

On Sunday morning the trip was resumed. This day's stint took us to Furnace Creek, Calif. and back to Las Vegas to complete the test observations.

Each evening Professor Neyhart and Ed Emond compared data they had recorded during the day. Neyhart used his "road test in traffic" form in observing and recording driving behavior. Emond recorded the test in terms of instrumentation on the special test panel which registered smoothness of operation, brake application, acceleration and deceleration, consistency of performance, etc. It was found that the instrumentation correlated the visual observation of driving performance very closely.

Here's a thumbnail sketch of the contestants' driving performance as reported by the experts at the end of the trip.

1. There was a high consistency to a planned pattern of driving, and the drivers' regular driving habits asserted themselves within the first 30 minutes.

2. The drivers evidenced total concentration. They were not influenced by anything other than the driving task. They showed that they worked at driving as a full-time job.

3. They drove in a totally predictable pattern.

4. Both drivers, through what Dr. Malfetti describes as a "look, look, look—drive, drive, drive" pattern, avoided involving themselves in any driving situation in which they did not leave themselves an out.

5. The regular speedometer was made inoperative—to determine whether or not the drivers could properly estimate their driving speed. A regulation police type speedometer was a part of the test panel for checking.

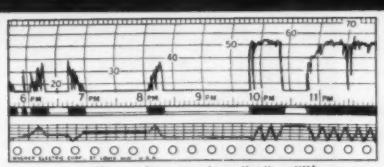
At high and low speeds there was a tendency for the drivers to miss their mark occasionally. Thus, when the driver thought he was going 60 he was actually traveling 65 or 70. However, both drivers were able to maintain a constant cruising speed when they were on fairly level roadway. Similar tests with average and violator groups have indicated a similar pattern, except that they do not show the same consistency as these two exceptional drivers. Therefore, a critical index of relative safe driving potential could be the ability to judge speed.

6. Similarly, the second critical index appears to be smoothness of ride. For example, the drivers had no sudden starts and no sudden stops. At no point was a driver involved in a "panic" stop. Neither gunned a single red light on the entire trip. This ability to plan ahead and see the big picture appears to be recorded by instrumentation with great accuracy.

In measuring smoothness of operation, a vacuum pressure gauge indicated changes in compression, and rapid changes were converted into a special counting device on the panel. A portable accelerometer registered unusually sharp acceleration or deceleration. Every mile of the course was registered on a tachograph.

The specially-equipped Dodge station wagon has been part of a 400 car fleet used by DuPont in a five-year road-testing program for its new Telar anti-freeze. The car was outfitted with special safety devices, including safety belts, recessed hub steering wheel, safety padding and safety door locks

UP TO 31 DAYS RECORDING on a single "strip" chart



(Recording on chart "tells all")

NEW WAGNER SANGAMO TACHOGRAPH

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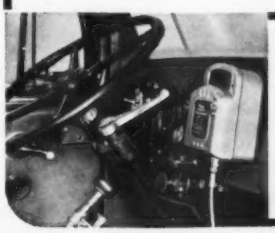
Mounted on the dash of a truck, this new type of recording speedometer permanently records vehicle operation up to 31 days on a single "strip" chart . . . graphic recording on chart indicates time truck engine started, time engine idled, starts, stops, speeds and distances traveled.

Information recorded on chart helps you plan better routing, control speed, and lower operating costs by encouraging safer driving and savings in time, gas, oil and tires . . . For details, mail the coupon.



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as well as accessory items such as cross-bar chains, first aid kits, fire extinguishers and special windshield wipers.

In evaluating the project results, Dr. Malfetti said:

"We have uncovered what appears to be very significant findings in both the area of what makes safe drivers safe as well as a new area—the probability that portable devices can be developed which can fairly and accurately measure what appear to be critical indexes of driver 'on-the-road' performance.

"Further, we have isolated what seems to be a most significant factor in safe driving, the safe driver's ability to organize instantly all of the factors in a complex driving situation so that he does the appropriate and correct action much on the level of a simple reflex action. It is this high-speed 'computer mechanism' which appears to be one of the main differences between a safe, average, or unsafe driver."

The organizational ability of safe drivers and its part in permitting the safe driver to do the right thing at the right time regardless of age or physical characteristics caused Dr. Malfetti to suggest:

"There is reason to raise questions about the validity of some of our standard techniques for predicting or measuring driver's on-the-road ability. Some physical characteristics and psychomoter abilities such as simple reaction time which are now thought to be important by many authorities do not seem to be meaningful when related to a group of proved safe drivers."

The Safety Research and Education Project at Teachers College, Columbia University, of which the Outstanding Safe Driver test program is a part, is concerned with determining the characteristics of the driver, improving these characteristics, and sponsoring the development of automatic devices to take over for the driver when he fails.

For the past two years the project has been involved in two studies aimed at developing an adequate criterion for measuring "good" and "bad" driver behavior. Up to the present, however, it has been most difficult to accumulate any large number of individuals who have excellent driving records over a long period of time. Spokesmen for the Columbia project say the Du Pont tests involving the National Safety Council's 20-year-or-more Safe Driver Award winners has provided just such a control group, thereby giving valuable aid for the completion of the studies now in process.

Holiday Hospitality

From Page 25

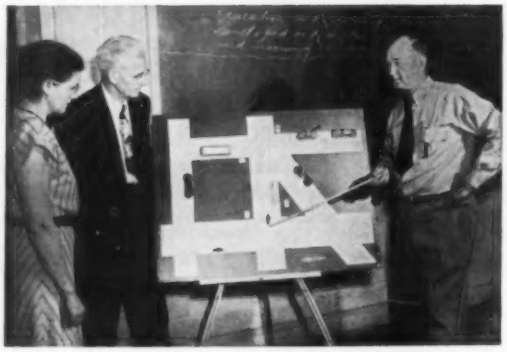
deaths and injuries on Texas highways," they said. "Our equipment and our personnel is being made available at our own expense in behalf of traffic safety."

The Governor's special Labor Day program of which these two projects were a part, was a concentrated effort to cut down the Texas toll over the holiday weekend.

The governor made a plea to Texas motorists to drive carefully and legally, and he asked Texas sheriffs and chiefs of police to crack down hard on violations involving excessive speed and drinking and driving.

Media cooperation was excellent.

Prior to the holiday, newspapers throughout the state gave generous amounts of space to news stories, feature articles and editorials about the holiday traffic problem. Radio and TV stations carried thousands of safety announcements, special interviews and programs. The Texas Association of Broadcasters again sponsored a program which they had used successfully over the Fourth of July. This was a "Drive Lighted and Live!" campaign in which drivers were asked to burn their headlights in daylight hours to signal their cooperation with safe and legal driving practices and laws.



THE "EYES" HAVE IT . . . .

Here is an aid that has proven practical in teaching visually the principles of safety. It's simple, effective and works wonders in teaching your drivers.
The MAGNO SAF-T BOARD is the result of studies by outstanding safety instructors and engineers. Safety directors, traffic managers, driving instructors, insurance agents and adjusters get a clear picture of how accidents occurred visually by reconstruction of conditions.

It is now being used from coast to coast by fleet owners, insurance and public utility companies, colleges and schools, and many other concerns interested in public safety. Consisting of a BOARD with typical street intersections on one side. The other side is a BLACKBOARD on which any street or road situation can be drawn with chalk and then erased. It has scale models of vehicles, traffic markers and accessories that can be placed in any conceivable traffic situation.

Write for our folder. It contains full information.

MAGNO SAF-T BOARD© EMIGSVILLE, PA.

Circle Item No. 5—Reader Service Card

NEW... SAFETY EQUIPMENT

Publication of product announcements in this section should not be construed as endorsement or approval by the National Safety Council.

For More Information—Circle Item on the Reader Service Postcard

Rubber Highway Dividers

Flexible material has been developed for these highway dividers. The new dividers are extruded from a special butyl polymer compound impregnated throughout with federal yellow. The compound is made to withstand years of abrasion, and is highly weather resistant. The standard units weigh approximately 11 pounds each, which allows easy handling and storage.

The material can be supplied in stock lengths (16′), with sufficient anchoring material, so the material may be cut for particular needs. They are quickly and easily installed, and can be removed and re-used. The dividers will not damage snow plows if accidentally struck.

Dividers are anchored to pavement with mushroom head anchor rods or with an opoxy resin material.

Pylacon, Inc., 48 N. Westwood Ave., Toledo 7, Ohio (Item 41)

Folding Steel Barricade

This all-metal barricade opens instantly to a full 8-ft. width from a compact 11″ x 2½″ x 36″. It can be carried in any type of vehicle.

The legs are made of steel tubing, and the reinforced channel cross members are glass bead reflectorized for added visibility.

It is finished in yellow and black enamel, and furnished with two red fluorescent danger flags. Flashers are optional.

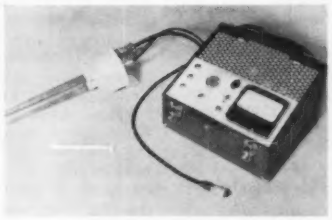
Albert A. Pendergast Safety Equipment Co., Tulip and Longshore Sts., Philadelphia 35, Pa. (Item 42)

Luminaire

New 2500 Series "Urbanoval" end-mounting street lighting luminaire is designed for residential areas or secondary streets where uniform, low-level lighting is desired.

The "Urbanoval" is designed for 100, 175, or 250-watt mercury lamps or incandescent lamps up to 4,000 lumens. This is the smallest in the family of end-mounted oval mercury luminaires, and provides efficient, low-cost lighting. A choice of two refractors provides A. S. A.—I. E. S. Type II or Type II—4 way distribution patterns with clear lamps, or Type III or 4-way distribution with phosphor-coated mercury lamps.

Revere Electric Mfg. Co., 7420 Lehigh Ave., Chicago 48, Ill. (Item 43)



Traffic Radar

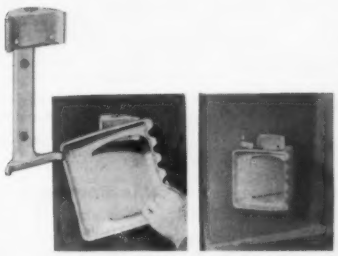
Model 400 "Trafficmaster," brings radar traffic control within the reach of every law enforcement agency. The unit is transistor powered and is compact, economical and efficient.

An adjustable range switch affords selectivity of range to suit traffic conditions. The maximum range is ideal for one-man, one-car operation.

The "Trafficmaster" is light, portable, and easy to connect to any automobile, and simple to switch from car to car. It can be operated from inside or outside the patrol car, or as a completely independent unit for roadside operation.

Single lane, multi-lane and two-way traffic can be monitored by simple operation of the range selector switch. The miles per hour meter can be pre-set to the violation limit, so that only violators will register on the meter.

Astrotherm Corp., 1625 Bellefontaine St., Indianapolis, Ind. (Item 44)



Wheel Block Carrier

This Wheel Block Carrier, painted traffic yellow, enables the driver to conveniently carry his own Safety Wheel Block right in the truck.

The Carrier can be mounted vertically on the side or horizontally on the underside of the truck. The blocks are carried or stored out of the way, but are readily available. The Carrier eliminates searching in loads, trucks or around docks for suitable wheel blocks.

Calumet Steel Castings Corp., 1636 Summer St., Hammond, Ind. (Item 45)

SAFETY PRODUCT LITERATURE

Plastic Street Light Globes

Here is protection against the actions of vandals. These plastic street light globes are said to withstand breakage while providing a high degree of light transmission. The product's resistance to breakage is illustrated in a 4-page brochure available from Plastic Age Sales, Inc., Mint Canyon, Calif. Facts concerning resistance to bullets and heavy rocks are offered as well as those concerning temperature, weathering, shock and heat factors.

For more details circle No. 81 on enclosed return postal card.

Traffic Marking Techniques

Supplied by the Trafficaide Corp., Auburn, N. Y., this brochure details traffic marking techniques for all purposes. Included in the brochure are diagrams showing variations of anti-skid directional reflectorized arrows, center lines, cross-walk or loading zone and others. This firm manufactures an extruded vinyl strip which is a permanent-type marker that is reflective and said to be readily bonded to pavement.

For more details circle No. 82 on enclosed return postal card.

Snow Plow Attachments

Allen Industrial Products, Inc., Menomonee Falls, Wis., has a bulletin available describing their complete line of snow plow attachments for fork-lift trucks. The plows range in width from 52 in. to 132 in. and can be mounted on all major lift-truck makes. An adjustable moldboard permits light bulldozing work as well as snow removal.

For more details circle No. 83 on enclosed return postal card.

Traffic Markings

Veon Chemical Corp., 20-09 Bridge Plaza North, Long Island City 1, New York, has literature available on Perma-Line the thermoplastic safety marking. The manufacturer claims it can be applied with amazing speed and dries almost instantly, without disrupting traffic. Unsurpassed for high visibility, durability and guaranteed safety protection in any climate.

For more details circle No. 84 on enclosed return postal card.

Warning Light

Designed to be used during daylight hours to provide an extra margin of safety for men working on streets or highways. Available in either amber or red lense, the portable flasher can be used on either a mast or tripod that raises the light to 11½ ft. It is equipped with an eight in. parabolic reflector lens. The transistorized circuit produces 1365 candle power at the rate of 50 flashes per minute. It weighs 12 lbs. without batteries and comes equipped with carrying handle and mounting bracket. R. E. Dietz Co., 225 Wilkinson St., Syracuse 1, N. Y.

For more details circle No. 85 on enclosed return postal card.

Two Way Radio

A new 100 watt vehicular communications unit has been announced by General Electric Communication Products Department. Available in low band frequencies of 25 to 50 mc. it comes in a case four in. high, 8⅝ in. wide and 15 in. long, allowing under the dash board mounting. Designed in two sections to facilitate mounting in trucks, under seats or various other parts of the vehicle. It draws only 1.75 amperes when "on" and ready to transmit. General Electric Communications Products Dept., P. O. Box 4197, Lynchburg, Va.

For more details circle No. 86 on enclosed return postal card.

Street Lighting Controls

The Ripley Company, Inc., Middletown, Conn., has literature available on their tubeless street light controls. Among the features are: phenolic base design isolating the 3-prong plug against flashover; hermetically sealed cadmium sulphide cell controlling relay; weatherproof plastic housing that will not discolor, crack or craze; built in lighting gap arrestor. Plus many other features designed to conform to EEI-NEMA specifications.

For more details circle No. 87 on enclosed return postal card.

Concrete Light Standards

Catalog No. 400, available from American Concrete Corp., 5092 N. Kimberly Ave., Chicago 30, Illinois, gives details on their line of light standards. Plus the advantages of prestressed concrete standards.

For more details circle No. 88 on enclosed return postal card.

Street Signs

California Metal Enameling Co., 6904 East Slauson Ave., Los Angeles 22, California, has information about their Procelite process which is said to provide porcelain enamel signs with easy readability by day or night. Combining the lifetime permanence of porcelain and glass with the strength of 18 gauge steel. Longer lasting, weatherproof, fadeproof, vandal proof design, with all aluminum hardware. Available in 6 in. wide sign plates with 4 in. letters.

For more details circle No. 89 on enclosed return postal card.

Multipurpose Sign Standard

Designed for holding message and directional signs needed in many different lines of road service. The Cadet, as it has been designated, lends itself to uses such as warnings, traffic directions and guide signs. Said to quickly collapse into a one in. thickness, storage would be simple. Properly set up the Cadet requires 6 sq. ft. of ground space, or 22 in. by 27 in. G. D. Bavin Co., 250 W. Sixth St. Bldg., Los Angeles 57, Calif.

For more details circle No. 90 on enclosed return postal card.

Overhead Sign Supports

Monoturbe overhead sign supports were developed to provide a simple and efficient means for mounting highway directional signs safely and adequately. These field-tested steel supports require minimum foundationing while providing unusually high strength and an attractive appearance. According to the manufacturer The Union Metal Manufacturing Co., Canton 5, Ohio.

For more details circle No. 91 on enclosed return postal card.

Actuated Traffic Controllers

This surface mounted magnetic detector features single lane detection, high sensitivity with sharp cut-off, dependability over a wide speed range, completely sealed, moisture-proof cast aluminum unit. Manufacturer claims that the street can be resurfaced over the detector which will last for years. Traffic Signals, Inc., P. O. Box 1303, 222 Beach Street, Shreveport, Louisiana.

For more details circle No. 92 on enclosed return postal card.

Sweeper-Blower

A self-propelled sweeper-blower rig that may be used for pre-marking cleaning. Capable of speeds from one to 50 mph., using eight speeds. The blower has a 10,000 cu. ft. capacity generated by a paddle type wheel. It is turn-table mounted for right, left or center operations. The nozzle can be manually swiveled through 360 deg. The broom is four ft. wide and available in either fiber or wire and has five sweeper positions. The broom is powered by a hydraulic motor and pump separate from the blower pump and motor. The broom can be raised or lowered for travel and adjustment. Topeka Mower, Inc., 623 E. 7th St., Topeka, Kan.

For more details circle No. 93 on enclosed return postal card.

Chemical Snow Removal

Complete information available on formula "33" a chemical snow remover for use on parking lots, driveways, loading docks and platforms, and other similar locations. Just sprinkle on. Leaves no whitening residue, does not crack or stain. Available in plastic lined containers for better and longer storage. Formula 33 Corp., 525 South 4th Avenue, Mount Vernon, N. Y.

For more details circle No. 94 on enclosed return postal card.

Speed Recorder

For over 20 years courts have recognized evidence obtained by use of the Dowden Speed Recorder. This 4-page bulletin lists municipal and state traffic enforcement agencies of all sizes that use it and explains how this portable, one-man operated unit indicates exact car speed. National Recorders, 7637 Lyndale Ave., S. Minneapolis, Minn.

For more details circle No. 95 on enclosed return postal card.

Minnesotans Are Prepared

From Page 19

with Gunnar Pederson, training officer, in outlining the program.

To start the program, five department employes were sent to The American National Red Cross camp for first aid instructors at Elkhorn, Wis., where they were certified as instructors. They were Charles A. Ross, Charles H. Getchell and John T. St. Martin, all of the safety division, and Lloyd Johnson and Robert Shufelt, maintenance employes.

They returned to instruct others, and within the year there was a trained instructor for each maintenance and construction district and for the central office. All training was carried out with the cooperation of the first aid and water safety section of the Red Cross.

Pederson, the training officer, praised the efforts of the 13 employes who were trained as instructors and carried the ball throughout the initial program.

"These instructors, the five who were trained by the Red Cross at Elkhorn, and the others trained by them, were the key to the success of the program," Pederson said. "Their enthusiastic attitude was reflected by the many compliments we received from the public and our own employes concerning the quality of their teachings."

The instructors will be re-trained every three years, and Pederson has urged that "field personnel who have received standard first-aid training be given a short refresher course each year during the slack period of winter months." Each instructor must undergo 10 hours of standard training, 16 hours of advanced instruction, and a Red Cross approved instructor's course before becoming qualified as a first aid instructor.

While the initial staff was composed of men from the safety division who were naturally safety conscious, subsequent first aid trainees included clerk-typists, operators of heavy duty machinery, mechanics, administrative employes and engineers, as well as others from various highway work assignments. But all showed an eagerness to become proficient "first-aiders" and to develop into valuable assets to the community and the highway department.

Employes, in turn, apparently have accepted the new services unconditionally and have been quick to turn to the trained first-aider for help in injury or sickness. Already there have been moments when first aid graduates have helped at scenes of distress, and the "first aid wagon" was parked in the midst of the picnic grounds when the central office held its annual picnic this year. In the past, highway patrolmen had carried the responsibility of handling emergencies at the picnic. This year, they were on duty, but they also had the assistance of department first-aiders in watching over the estimated 2,000 persons attending the annual event.

Field workers have given a hand at several traffic accident scenes since the program was completed, and there is increasing evidence of improved care of ill and injured employes. Yes, both the public and highway department employes are beginning to reap benefits of this program that costs the state very little and promises to cost less in future.

The overall effect is not expected to be evident immediately, and statistics do not show the true picture so early in the program, but there is some indication of return. At the end of 1959, there was a reduction of $30,000 in compensation disbursements in comparison with the previous year. (This doesn't take into consideration the reimbursements gained after the initial outlay by the state). Of course, the first aid program cannot take full credit for this reduction because there are too many related factors, but it is fair to infer that the first aid program contributed to a reduction in mishaps and severity of injuries that are the basis for these compensation payments.

The STEPHENSON RADAR SPEEDALYZER

provides more deterrent power with less manpower

ONE policeman, or at the most two, provides all the manpower necessary to operate this new radar speed control. With electronic infallibility, it measures speeds up to 100 miles per hour by cars 100 to 600 feet away, trucks and buses up to 1,500 feet distant. Violators are detected passing in either direction. The Speedalyzer consists of five components: (1) an amplifier with *transistorized* power pack; (2) a power cable; (3) a meter with attached cable; (4) an antenna that can be aimed in any direction; (5) a 65 miles-per-hour tuning fork. Total weight is about 20 pounds.

Send coupon for further information

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Circle Item No. 6—Reader Service Card

X-Ray on Traffic

From Page 17

of cities and states in traffic safety as reported in the Inventory. In addition, the Inventory provides the information upon which other organizations also recognize activities in various areas. The American Bar Association, the American Association of Motor Vehicle Administrators, the Institute of Traffic Engineers, and the International Association of Chiefs of Police present awards based on Inventory information and so do some of the states that give awards to cities within their boundaries.

When the evaluation of the reports is completed, the grading information is gathered into a book which is presented to a committee of judges who administer the award program. Cities and states eligible for awards are noted and the judges consider all that meet the requirements for awards specified by the Inventory Advisory Committee and approved by the Traffic Conference and the Board of Directors of the National Safety Council.

The next stage in the Inventory process is preparation of written analyses of the needs of each state and city traffic safety program. Prior to writing the analyses of the reports the National Safety Council's district directors are brought into the headquarters office to consult with each specialist on the problems and needs in all the states and large cities in their districts.

The analysis writing stage alone takes from three to four months to complete. Considering that almost 1,200 cities are involved and the analysis covers program deficiencies as well as recommendations for improvement, this is really a short length of time. Each city's report is gone over in detail by the specialist in charge. After the writing is completed the analysis is sent out to be printed.

The printed analyses are sent to the district directors for presentation to the states and large cities and to the state inventory directors and their staffs for their presentation to smaller cities. An analysis is reviewed before presentation; a meeting is scheduled with public officials of a city to discuss each section of the report with those concerned with its administration; then arrangements are made for a public presentation of the results. Further assistance is available from the National Safety Council in realizing some of the recommendations, or aid may be obtained from other national organizations or state governments.

This is the extent of processing the report forms as the main function of the Inventory administrative process. But the Inventory does not stop here, it is in constant flux. When one year's evaluating and analysis writing is completed, plans are being made to conduct the next. The inventory is also dynamic within a city and state. This latter point is best exemplified by taking a brief glance at how the 1959 Award of Honor winners have been involved in the Inventory.

The Saginaw Experience

During the six years the City of Saginaw has participated in the Inventory it has improved its total program work 13 per cent. This is an excellent record in view of the fact that standards of measurement have also risen during this six year period, which means that Saginaw has had to increase its program work more than proportionately.

From 1955 to 1960 the city increased its scores in every section except one. In that one the city maintained the same high level it had in 1955. Its lower score was a reflection of the greater improvements made in other cities. The increases in scores can certainly be laid to the determination of city officials and the cooperation of the people of Saginaw.

The results of the work of officials and the people of Saginaw in the reduction of deaths and injuries from motor vehicle accidents shows what success a vigorous campaign can achieve. Recommendations made in the Annual Inventory of Traffic Safety Activities have definitely had a part in aiding the city.

Having achieved the Council's highest award for a traffic safety program, Saginaw will now look to the future and hopefully continue its splendid work. In the presentation of the 1959 Inventory analysis to the city, the officials and people of the city were reminded that increases in the number of vehicles and vehicle miles travelled would necessitate further effort to keep pace with present results. Some of the improvements that could be made in the present program were also outlined, as determined from the Inventory, including mechanization of record keeping and increased training for police officers.

Virginia's Record

The state of Virginia has a long and outstanding record in the promotion of traffic safety activities. As early as 1932 the state put into effect a motor vehicle inspection plan and two years later had a one year mandatory suspension of driver's license for driving under the influence of alcohol.

Although the state began participation in the Council's Annual Inventory

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Circle Item No. 7—Reader Service Card

in 1945, this venture received its real impetus with the development of the Governor's Highway Safety Committee in 1947. The committee's biggest task was to convince the public and officials of the horror of the traffic accident picture and to achieve public support in all phases of the state's traffic safety promotion.

Hiram M. Smith, Jr., director of public information of the Governor's Highway Safety Committee, pointed out early this year, "It (the Inventory) has brought a spirit of healthy competition among communities and an understanding of mutual problems. It has brought officials from various communities together in a common cause and they have been able to exchange valuable ideas and experiences. The over-all effort has most definitely aided in focusing public attention on safety and an awareness that local officials are also concerned."

As mentioned previously in this article, Virginia had outstanding programs in nearly all of the areas covered in the Inventory. Through the last five years the state has consistently maintained high scores in all the sections. The programs within the state have consistently progressed, as have the standards set by the advisory groups for evaluation of the sections.

In 1950, Capt. W. L. Groth, then safety officer of the Virginia State Police, organized the Virginia Association of Traffic Safety Inventory Representatives. This group, the only one of its kind, is composed of Inventory representatives and the officials who assist them. It is a permanent group with elected officers, and it holds an annual meeting at which noted speakers appear and round table discussions are held concerning the Inventory. This organization has been instrumental in helping various cities to achieve substantial improvements in their traffic safety programs, and, ultimately, to help the state reduce its traffic fatality toll.

Judging from its past record, Virginia should continue to show fine results in the promotion of traffic safety and the development of the necessary tools with which to carry on the struggle against traffic accidents.

Summing Up

The primary purpose of the Action Program and the Annual Inventory of Traffic Safety Activities is the reduction of traffic accidents and fatalities. The Inventory serves to measure the progress made by states and communities in applying the Action Program's tenets. It also keeps attention directed to the changes in recommendations of the program through its requirement of annual reports.

The Traffic Inventory program does several other things. It provides the stimulation for communication and the common ground upon which citizens and public officials can work together with national organizations in solving traffic problems. In giving recognition through its awards, the Inventory provides incentive to cities and states to strive for better traffic safety programs.

The Traffic Inventory also collects accident prevention data which may form the basis for research into correlation of accident experience and features of a traffic safety program.

By no means a perfect tool, the Inventory does accomplish its main functions. Ideally, with adequate budget and personnel, each city or state could be surveyed, then even small problems could be solved. However, this is not intended in the Inventory organization, although the analysis frequently leads to detailed surveys by professionals in other organizations.

It is important to note that the service of the Traffic Inventory program is not only available free of charge, but also that there are no governmental pressures applied to cities or states to participate in the program. This is a credit to the traffic safety movement and the principles of democracy espoused by the citizens and officials of all the cities and states using the Inventory.

State Traffic Legislation

From Page 21

insurance and to report its findings on or before March 31, 1961.

In South Carolina the "uninsured motorist" laws were amended to increase the additional registration fee payable by uninsured drivers. Another provision makes free of cost the endorsement on liability policies providing coverage for damages caused by uninsured drivers. A Senate Committee studying vehicle liability insurance rates was directed to continue its study, and a joint committee was created to study all matters relating to assigned risk insurance.

Virginia amended its "uninsured motorist" law to increase the additional registration fee charged uninsured drivers from $15 to $20. The legislature adopted a resolution expressing its desire that the cost of the "uninsured motorist" endorsement to liability policies be borne entirely by uninsured drivers.

Suggestions Requested

The Subcommittee on Definitions of the Committee on Uniform Traffic Accident Statistics will revise the manual, *Uniform Definitions of Motor Vehicle Accidents,* Second Revision.

Please forward any suggested revisions to this manual to: Elbert Hugunin, secretary, Committee on Uniform Traffic Accident Statistics, National Safety Council, 425 N. Michigan Ave., Chicago 11, Illinois.

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Circle Item No. 8—Reader Service Card

Washington, D. C. Launches Driver Study

Drivers who find their licenses revoked or suspended under the District of Columbia's point system will be the subjects of a three year study of drivers' attitudes, George A. England, D. C. director of motor vehicles has announced.

Researchers from George Washington University will carry out the unique program under the terms of a $270,000 grant from the National Institute of Mental Health. Dr. Thelma Hunt of the university's psychology department will direct the project which will begin immediately and have its first contact with erring drivers sometime in 1961.

Both 12-pointers who have had their licenses revoked and eight-pointers who have had them suspended will be included in the study. Violators are to be divided into two equal control groups on the basis of age, sex and race; the first group will be enrolled in the District's traffic school as they are at present, while the other group will be subjected to personality tests, attitude tests and three group counseling sessions.

Twelve-pointers will be able to reapply for a driving permit after six months, and suspended drivers will have their licenses returned at the time designated by the department of motor vehicles. Officials emphasized that the study will not change the time required for drivers to "earn the right to drive again."

Records of drivers in both groups will be kept and examined for at least three years. Comparisons of the violations and accident records of the two groups will be made at that time.

"National figures show that 92 per cent of the drivers never have a traffic violation, 4 per cent are occasional violators and the remaining 4 per cent are chronic violators," said Dr. Hunt. "Our study is aimed at finding out what attitudes are common among the repeaters. We hope to discover why these people are in court so much of the time, and perhaps develop some counseling and re-education techniques for dealing with them."

Approximately 330 licenses are revoked each month under the District's point system. During the same time another 550 drivers have their licenses suspended.

Dr. Hunt emphasized that while a number of states have point systems similar to the District's, none are as ideally suited for such a study and experimental program.

Driver Ed Awards

From Page 23

logical answer is state legislation to provide money for this project.

"Seventeen states now have legislation providing for financial assistance for driver education. In these states during the 1959-60 school year, 83 per cent of the schools offered a course in which 73 per cent of the annual eligible students were enrolled. In the remaining states covered in the 1959-60 report, only 68 per cent of the schools offered a driver education course and only 45 per cent of the eligible students were enrolled.

"This is evidence that state financial aid is a necessity. Once this fact is recognized and accepted, the public will be convinced and driver education will once again resume its steady climb toward its rightful place in our educational system."

Other members of the Board of Judges were: Wayne P. Hughes, director, school and college division, National Safety Council; Norman Key, secretary, National Commission on Safety Education, National Education Association; Francis P. Lowrey, assistant managing director, Auto Industries Highway Safety Committee; John Haack, coordinator, audio-visual and safety education, Davenport (Iowa) Public Schools; Robert Willis, immediate past president, National School Boards Association; Joseph M. Nelson, president, American Driver and Safety Education Association; Earl Allgaier, manager, driver education division, American Automobile Association; Jesse T. Anderson, state superintendent of education, Columbia, S. C., and the Rev. O'Neil C. D'Amour, associate secretary, school superintendents' department, National Catholic Education Association.

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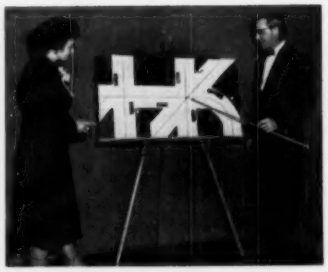

Board consists of (3) interchangeable sections—14" x 22" each—Enables you to simulate various intersections. Back has replica of 4 lane highway and blackboard surface for special situations.

World-wide acceptance by driver education instructors, insurance adjusters, lawyers, magistrates and safety engineers.

Scale model vehicles and traffic equipment supplied.

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Circle Item No. 9—Reader Service Card

Traffic Safety

Vol. 4 No. 4
December 1960

RESEARCH REVIEW

A NATIONAL SAFETY COUNCIL PUBLICATION

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The RESEARCH REVIEW is a quarterly supplement published by TRAFFIC SAFETY for the reporting of research that relates to traffic safety. This service is designed to provide those who conduct research, and/or utilize research findings, information that contributes to, advances, or clarifies the body of traffic safety knowledge. The value of research and the prevention of duplication and overlap is enhanced by prompt reporting. To fulfill this purpose, the RESEARCH REVIEW will present completed reports, abstracts, summaries of research in progress, and information regarding contemplated research.

The opinions expressed and conclusions drawn are entirely those of the various authors of these papers. TRAFFIC SAFETY and the National Safety Council accept no responsibility for them, and publication should not be deemed as either endorsement or approval of the ideas expressed or devices described.

Manuscripts appropriate for publication should be submitted to the Research Division of the National Safety Council, 425 North Michigan Ave., Chicago 11. Manuscripts cannot be returned unless accompanied by a self-addressed, stamped envelope. Editorial handling will be easier if manuscripts are typed, double-spaced in triplicate, and accompanied by an abstract of 200 words or less and all original art work. Any other information regarding research in progress or contemplated research can be submitted in any form that outlines the full particulars, i.e., investigator, problem, hypotheses, methodology, desired or expected outcomes, etc.

2 **Research Briefs**

Book reviews and author's biographies.

4 **Operation Analysis of Traffic Safety—Part IV—*Fletcher N. Platt***

—Proposed Fundamental Research on Driver Behavior
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. . . give me commentators plain,

RESEARCH BRIEFS

BOOK REVIEWS

Driver Education and Driving Simulators by James H. Fox, Ph.D., edited by S. A. Abercrombie and Norman Key, published by the National Commission on Safety Education, National Education Association, Washington, D. C.

Occasionally, to our acute embarrassment, we find that we have either overlooked or neglected to mention some work that deserves to be brought before the eyes of the public without delay. Such is the case here; this booklet was to be reviewed in our September issue but unfortunately did not appear because of space limitations. Dr. Fox and the National Educational Association's staff have compiled within the covers of this 72-page booklet as much useful information as the printer's art would permit.

Not only are various driver education teaching devices reviewed in both their positive and negative aspects, but validation studies relating to each are also included. A great deal of space is also devoted to the research of the armed forces on synthetic training devices both with regard to complex tasks and judgmental activities. The authors discuss such topics as the conditions of positive and negative transfer and they present a very comprehensive bibliography which should furnish a nearly complete listing of source materials for teachers of driver education. Prices: Single copies $1.50; 2-9 copies, 10 per cent reduction; 10 or more copies, 25 per cent reduction. Copies obtainable from the National Education Association, 1201 Sixteenth Street, N. W., Washington 6, D. C.

The Heart in Industry published by Harper and Brothers, New York.

Although the following discussion may appear inappropriate in a journal devoted to traffic safety research, *The Heart in Industry* contains a chapter which should be read not only by physicians, but by motor vehicle administrators and, we hope, by cardiac patients.

Chapter 11 of this text, "The Cardiac in Vehicle Operation and Aviation," by Harold Brandaleone and Gerald J. Friedman with comment by William Haddon, Jr., contains a wealth of clearly written and enlightening information on this subject. The authors subdivide the subject area into three main categories: (1) the patient's ability to operate any type of vehicle, (2) the patient's ability to operate a vehicle as part of his occupation and, (3) the patient's ability to operate a motor vehicle with safety to himself, his passengers, and the public.

With a problem of such magnitude, as might well be expected, more than one point of view is expressed. Certain legal and ethical problems are raised and discussed and should prove to be of great assistance to those who will ultimately resolve through legislation the answers to these problems.

The authors of this article are eminently qualified to discuss the role of the cardiac in vehicle operation, as is Dr. Haddon who prepared the special comment. We sincerely hope that this chapter receives the widest possible circulation and readership in the traffic safety field.

INTERNATIONAL CONFERENCE

The Organization for European Economic Cooperation sponsored an international road safety research conference this summer. The meeting was held at the Road Research Laboratory of the United Kingdom Department for Scientific and Industrial Research at Langley, Buckinghamshire.

The major topic of discussion had to do with scientific research into road safety on an international cooperative basis. Fifty leading research workers from Austria, Belgium, Denmark, France, Greece, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, The United Kingdom, and the United States, discussed all the main aspects of scientific research of road safety.

Areas discussed included the statistical analysis of road accidents; vehicle design and maintenance; road layout and surface; traffic controls; propaganda and law enforcement; the behavior of road users; crash injury research and medical aspects of road safety. They also considered the best means of making known the results of research and whether new arrangements should be made for closer collaboration among research workers.

The meeting culminated in the drawing up of recommendations designed to intensify road safety research on an international basis so as to insure that its results would be made available to be put into practice in all countries.

United States representatives attending the conference were: Edward H. Holmes, Assistant Commissioner for Research, U. S. Bureau of Public Roads; Norman Damon, Vice President, the Automotive Safety Foundation; John O. Moore, American Safety Equipment Company; and Fred Hurd, Director of Yale University's Bureau of Highway Traffic.

John J. Flaherty

. . . who with no deep researches vex the brain

—G. Crabbe (1754—1832)

THE AUTHORS

John E. Corbally

Dr. John E. Corbally has been on the faculty at the University of Washington since 1927. At the present time, he is Professor of Secondary Education, Director of Student Teaching, and Acting Director of the Bureau of School Service and Research. He has been actively interested in safety education for a number of years. He was instrumental in arranging a safety education Institute, on the University of Washington Campus in 1940, which was sponsored jointly by the University of Washington and the Seattle Traffic and Safety Council.

Since that time, Dr. Corbally has attended several National Safety Congresses as a committtee member or chairman of a committee. He served as chairman of the Membership Services Evaluation Committee, general chairman of the Higher Education Committee, and at present is on the Executive Committee of the Higher Education Section of the School and College Conference. He teaches a course in Principles of Safety Education and has co-sponsored courses in Driver Education at the University with Mark M. Knoll.

Dr. Corbally has been a high school teacher, a principal, and a school superintendent in the State of Washington. He received his Ph.D. degree from the University of Washington in 1927.

Mark M. Knoll

Mark M. Knoll has been with the Seattle School system since 1945. Shortly thereafter he became interested in Traffic Safety, especially as it pertains to the teenager.

Mr. Knoll graduated from North Central College, Naperville, Illinois, in 1927 and began his teaching career in the state of Washington at that time. He has had experience in grade, junior high and high schools as a classroom teacher, principal and superintendent. He has conducted classes in the field of Traffic Safety at Central Washington College of Education and at the University of Washington where he worked with Dr. John Corbally.

While at the University of Washington Mr. Knoll directed a teaching film in driver education, *Turns With No Regrets*, which has been well received in the United States and South America.

Mr. Knoll attended Traffic Safety workshops at Michigan State University and Purdue University. He has also taken work at Michigan State and received his Master's Degree from the University of Washington. He was instrumental in founding the Washington Driver Education Association and has served it as a director. He is a charter member ot the American Driver Education Association and has been a director since its inception.

Fletcher N. Platt

Fletcher N. Platt has been associated with the Ford Motor Co. since 1950. He assumed his present position, manager of the Traffic Safety and Highway Improvement Department of the Public Relations and Advertising staff, in 1954.

He was born in Philadelphia in 1917 and was graduated in 1938 from the University of Michigan with a B.S. in Aeronautical Engineering. Before joining Ford, he was associated with Chance Vought Aircraft, Kaiser Cargo, Inc. and the Rheem Manufacturing Co. He is a member of the Institute of Traffic Engineers, Institute of Aeronautical Sciences and Society of Automotive Engineers. Mr. Platt is currently a member of the Board of Directors of the National Safety Council.

H. Laurence Ross

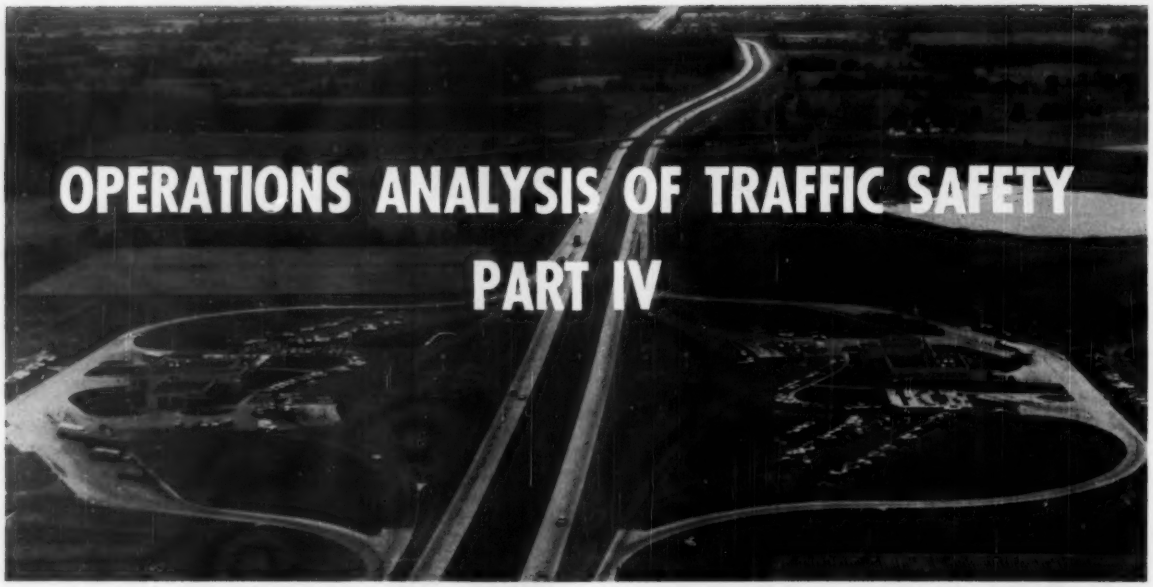
Dr. Ross is a member of the Department of Sociology at New York University. He was formerly the behavioral scientist for Case Studies of Traffic Accidents at Northwestern University's Traffic Institute. His assignment on this project was to explore the applicability of sociological theory and research methods to the study of traffic accidents.

Graduated from Swarthmore College in 1955, he received his doctorate from Harvard University in 1959. During his graduate years, Dr. Ross served as research assistant to Samuel A. Stouffer and spent a year at the University of Chicago as a Fellow of the Social Science Research Council. His areas of special professional interest, as represented by his previous publications, are community structure and the social psychology of city life.

Robert H. Schwarz

Mr. Schwarz recently left the Army to accept a position as Supervisor of Special Activities for the Waukesha County School System in Wisconsin. Prior to this he was an officer assigned to the Research and Development Division of the Adjutant General's Office, located in Washington, D. C.

He received the M.A. degree from Columbia University in 1949. He taught for one year, then was called into the Army during the Korean War, along with other reserve officers. With the exception of the tour in Korea, he has served in the Army as a psychologist, and while stationed in Washington has completed the course work for the Ph.D. degree at American University.



OPERATIONS ANALYSIS OF TRAFFIC SAFETY PART IV

Proposed Fundamental Research on Driver Behavior

by Fletcher N. Platt

INTRODUCTION

An operations analysis of traffic safety has been established theoretically in the first three parts of this paper.* However, theory is of no value without substantiation by experiment and practice. This part will describe an approach for experimental research to verify the theory and to obtain constants for the equations.

This research should provide:

1. Basic information for developing driving simulator requirements.

2. Information for evaluating current driver training practices and developing new techniques.

3. Information relating to physical and psychological reaction of drivers under actual driving conditions.

4. The effects of different kinds of vehicles and vehicle equipment on driver actions.

5. An evaluation of the traffic flow theory, relating driver actions to various traffic densities and movements.

Ed. Note: In earlier issues of the *Traffic Safety Research Review*, Mr. Platt presented an extensive theoretical framework. In December, 1958, Part I dealt with a classification of traffic situations. In the June, 1959 issue, empirical formulas and equations were presented for estimating the number of events, observations, decisions, actions, errors, etc., as they might occur to a single driver. In Part III, September, 1959, logical procedures were developed for determining fundamental goals and for determining measures of effectiveness to be used for the evaluation of traffic safety programs. The present article is an applied extension of the other three.

*Summary and reference of parts I, II and III.

6. The effect of environment on driver actions.

7. An opportunity to study the whole problem of traffic safety with the ability to change one major variable at a time.

8. Lay the ground work for a mathematical programming approach to the traffic safety problem.

This proposed research differs from others in the traffic safety field on several bases:

1. It proposes to study traffic safety without direct reference to accidents or resulting casualties.

Obviously, accident studies are important, but the study of measured factors leading up to a potential accident situation may be of greater significance than evaluating the physical and psychological factors of an accident. Accident records will be used as a check on the theory and experimental results.

2. It proposes to study the driver, vehicle and environment relationships simultaneously rather than as single components of the overall problem.

It is generally believed that the greatest need for research in traffic safety is in driver behavior. However, driver behavior alone, unrelated to environment or vehicle, is probably quite misleading. On the other hand, if a number of drivers are studied in different vehicles and environmental conditions (in great detail) by recording all aspects of a particular series of driver situations, for analysis at a later time, it may be possible to establish the reasons for driver errors and consequently the reasons for accident occurrence.

DISCUSSION

As outlined in earlier parts of the paper, traffic situations from the driver's viewpoint can be divided into events, observations, decisions, errors, actions, near collisions and collisions. Tables and equations were presented in Part II suggesting methods of counting events and approximating the probability of subsequent situations, i.e., observations, decisions, etc. However, when consideration is given to the problems relating to the experimental evaluation of driving situations, it appears necessary to modify the method presented in Part II to simplify the collection and analysis of data.

Method of Counting Events

In order to count traffic events, the investigator must decide how to add both continuous and discrete events. This can be done easily if we define an event as "a situation that occurs in a *one-second time interval* in the traffic environment of the subject vehicle." It is then possible to physically count the number of events that occur in each second as a car moves through the traffic scene (whether they be continuous or discrete). A camera, mounted inside the car, designed to take pictures every second, will provide a means of obtaining photographs for counting the number of visual events that occur in traffic. Aural events can be recorded by tape or dictaphone. Kinesthetic and static events can also be logged simultaneously on a recorder when desired. (Kinesthetic and static events are not included in the preliminary tests.) It is believed that these four sense modalities are the only important ones to the driver under most circumstances, and if we record these simultaneously during a test run they will be available for detailed evaluation in the laboratory.

Measuring events in terms of time, rather than in terms of distance, has an advantage in the over-all analysis because the driver's physical abilities of observation, decision and action are limited by time. With this modification of the original concept, the whole sequence of situations is based on a time variable. Obviously, translation to a distance parameter can be easily accomplished.

Events must be broken down into several categories for various purposes that will become apparent later. These categories include: (1) events by sense modality, (2) events related and unrelated to driving and (3) hazardous events, i.e. those that would cause high deceleration forces and damage to the vehicle, or personal injury if impacted.

Method of Counting Observations

Driver observations can be obtained in several ways. The most direct way is to ask the driver to describe his observations as he drives and pick up the information on a recording device. The driver can record his observations without difficulty except in very heavy traffic densities.

It is assumed the driver's peripheral vision is operative at all times and that the small cone of clear vision is focusing on one object and then another at the maximum determined by physical limitations.

Preliminary experiments on the observations of a driver, particularly those in the visual sense, will be discussed in the next section. It appears, however, that individual observations range from ½ to 2 seconds in duration and therefore can be recorded aurally. Although it is obviously not possible to record every observation, important observations specifically attended by the driver (particularly those related to the driving scene) can be recorded and can be checked by an observer.

Driver Depressants

There is no question that if a driver is taking a test he will probably drive differently than he does under ordinary circumstances. If he is asked to record his observations he undoubtedly will be as alert as his capabilities will permit. He will probably make more observations during the test than when driving solo. In order to evaluate the driver's abilities not only under the ideal conditions, but under simulated adverse conditions, it is important to develop certain tests that will depress the driver's alertness in respect to driving scene (and do it safely). It is also important to know what percentage of the time the driver spends on the driving task itself, observing events related to driving and the percentage that is spent observing unrelated events. Obviously, this will vary from one traffic scene to the next and from one driver to another. A means of distracting the driver, and at the same time obtain a quantitative measurement of his observations related to driving, is developed in the next section.

Measuring Driver Decisions and Actions

Driver decisions are complex and overlapping. One decision will usually require the use of hands and feet simultaneously in order to modify the direction, speed of the vehicle or both. Instead of attempting to measure the number of driver decisions, which may be impossible, driver actions (the number of changes of speed and direction of the car) can be recorded and analyzed. Other driver actions such as signalling, shifting gears, or smoking will be added for a total. Although decisions of inaction are omitted, they will be reflected in the comparison of different drivers. It is assumed that decisions of inaction will

Figure 1

be made at frequent intervals between actions. It could be assumed that finite decisions are being made continuously at a rate equal to the number of observations. Each observation requires a decision "to act" or "not to act."

Driver actions can include:

(1) Change speed
increase—accelerator
decrease—accelerator
accelerator and brake

(2) Change direction
one hand
both hands

(3) Signal, or shift
one hand

(4) Other actions related
lights, wiper, etc.

(5) Other actions unrelated

Incorrect Actions and Near Collisions

Incorrect driver action is classified as (1) aggression towards others, (2) aggression by others, (3) potential loss of control, (4) incorrect positioning, and (5) moving violations. Near collision can be defined as (1) temporary loss of control, (2) sudden change in direction, (3) instability of steering, (4) proximity to hazardous events, and (5) causing emergency braking, swerving or skidding by others. Incorrect actions and near collisions can be recorded by an observer in the vehicle and later checked by the film taken of the traffic scene.

PILOT STUDY RECOMMENDATIONS

Route Selection

Tests should be run on preselected courses so the route selection is important in the development of this approach. Several courses were tried and a preliminary route selection was made (for these preliminary tests) of a course exactly 10 miles long covering 12 different driving environments. This included urban, residential and rural roads, one-way, two-way and four-way undivided and a four-way divided limited access highway. It also included a two mile stretch of rural two-lane road over rolling country. The route is along certain major arteries through the city which permits test runs with a wide range of traffic densities. A number of pedestrian crossings are along the route as well as a number of traffic signals, stop signs, yield right of way signs and other warning and direction signs. The route has been run a number of times in order to record fixed and hazardous events.

Commentary Driving

In order to determine the ability of a driver to record his observations, the author has driven several hundred miles with a dictaphone, recording driving observations. It has been found that a driver can record not only all of the important observations necessary to control a car, but at the same time a number of unimportant and unrelated observations. Tests show the number of observations recorded during a typical run will be about one every three seconds.

Figure 2

Commentary driving was tried on several runs of 45-minute duration and did not impose any great hardship on the driver. However, following completion of the run, there was evidence of more fatigue than normally experienced on the same run.

Quantitative Distraction Tests

As discussed earlier, it seems desirable to develop a safe method to distract the driver in order to test him below his best performance. A new scheme has been developed by the author that seems to meet these requirements. The driver is instructed to drive the car at his normal pace, but when he is not required to pay full attention to the driving scene, he is to read the sweep-hand of the instrument panel clock. The author has found this is an effective way of applying a measurable distraction to the driver, and one that will block out almost all other distractions. First of all, the driver will tend to go back to the driving scene and forget the clock, if traffic conditions demand.

It is relatively safe, as it is a self-imposed task. Recording the reading of the sweep-hand permits analysis of the percentage of time the driver is observing the driving scene. Under light traffic conditions, the driver can read the sweep-hand every two to three seconds. When passing another vehicle, the interval may be as much as seven to ten seconds. In heavy traffic, or at an intersection, 20-30 second intervals may be required.

Driving in a Hurry

Much has been written in traffic safety literature about the driver who is in a hurry. Undoubtedly, every driver is in a hurry at one time or another. Therefore, it seems reasonable to attempt to simulate the conditions of a "driver in a hurry" by demanding the completion of the trip in a fixed time. (Several minutes less than first test run.) Obviously, this would not be the extreme urgency that might be demanded under some circumstances, but it gives indication of the problems relating to the "driver in a hurry." In the few tests made, the "driver in a hurry" made fewer observations relating to the driving scene, than when driving normally. (Probably because of his concentration on the driving task.) In other words, the distraction of commentary driving was less important than the desire to complete the task on time. This psychological condition can also be duplicated in any driver by asking him to rerun a course in some greater time than his first run. On several runs made with this in mind, the driver also recorded fewer observations per minute, than under normal driving conditions and only a few more observations over the entire course. (He made fewer observations relating to traffic than the difference in traffic conditions would warrant.) This test may not be typical and was based only on several trial runs, but it indicates the kind of information that might be obtained. It is the author's opinion that it is more important to obtain the limits of several drivers' abilities than averages from a large sample of drivers.

Traffic Index Recorder

A traffic index recorder (Fig. 1) has been developed by Professor Bruce Greenshields of the University of Michigan. It records speed, distance, time, change of speed, change of direction and the number of speed and direction changes. With the exception of speed and time, all data are indicated on counters, thus the information is continuously integrated over the trip run saving time in analysis. A 16 mm. camera takes pictures at fixed time or distance intervals.

The index recorder, used in conjunction with a camera photographing the traffic scene, will give a space, time, speed relationship of the subject vehicle. The traffic camera and mirror arrangement, developed by the author, is shown in Fig. 2. The front and rear traffic scenes taken with this camera is shown in Fig. 3. Preliminary tests made with this equipment, have shown that it is capable of giving the information desired.

Recording of Driver Incorrect Actions and Near Collisions

Forms have been developed for use by field observers and office analysts to record the number of incorrect actions and near collisions during the test runs. These have been checked out and demonstrate that it is possible to evaluate these factors in the field and from the photographs.

Proposed Driving Tests

In the initial tests, it seems desirable to try to obtain the maximum and minimum limits rather than to establish

Figure 3

averages. This should be kept in mind when selecting drivers, routes to be followed, traffic conditions and environmental variables.

Recommended tests are as follows:

A. Basic Tests
   1. Instruct driver to drive at own pace.
   2. Driver to hurry—complete route fixed time limit.
   3. Driver to go slowly—be extra careful.

B. Complex Tests
   1. Commentary Driving—have driver state each object he sees, both related and unrelated to driving.
   2. Distraction Test—The driver shall call out the sweep hand of clock whenever it does not interfere with driving task.

C. Tests Repeated for Different Traffic Densities
   1. Light
   2. Heavy

D. Tests Should be Repeated in the Same Vehicle and Same Route for Different Subjects by Driving Experience.
   1. Inexperienced Drivers (16 to 20 years old)
   2. Inexperienced Drivers (30 years and over)
   3. Professional Drivers with good records (15 years experience or more.)
   4. Driver Education Teachers

The Soldier as a Driver:

AN OPINION SURVEY

by Capt. Robert Schwarz

INTRODUCTION

During the 12 month period ending March 31, 1959, there were 3,955 Army personnel injured in accidents involving the operation of privately owned motor vehicles while off duty. This represents 17.5 per cent of all injuries to military personnel during this 12 month period. Of the 3,955 who were injured as a result of accidents involving privately owned vehicles, 448 (11.3 per cent) were injured fatally. These deaths represent 60 per cent of all accidental military deaths during this period. The direct cost to the government amounted to more than $20 million dollars.

THE PROBLEM

There are many approaches to the problem of automotive safety. Prominent among them is modern traffic engineering. It seems apparent, however, that despite the large sums of money expended to engineer better and safer highways, the variable of utmost importance is still the individual driver. Without the cooperation of the "man behind the wheel," no safety program can achieve real success. The "foolproof" highway has never been and will never be built.

The essential problem faced by personnel responsible for traffic safety is the difficulty of ascertaining the most effective means of communicating the driver safety message to the people for whom it is intended. The success of a safety program, or any program designed to encourage an individual to modify his behavior in response to the receipt of information, is dependent on the impact of that information upon the value system of the individual. More simply state, if the message doesn't seem important to the individual, it will be ignored. Based on this premise, the question arises as to the efficacy of the different methods of encouraging safer driving practices.

For many years the general public has been the target of a wide range of safety messages. Realistic pictures of accidents, cartoons, wrecked cars and signs of every conceivable type have been displayed. There have been appeals to the "good neighbor" spirit and thinly veiled threats such as "speed trap ahead." Extensive as the coverage has been in the civilian community, the exposure to safety information is even more widespread in the Army. Military authorities are keenly aware of the loss to the service represented by an automobile accident.

This survey is based on a study the purpose of which was to examine the techniques used to encourage safer driving at Army installations located in the United States. The goal was to ascertain the impact of each safety technique on the target—the soldier driving a privately owned car while off duty.

PROCEDURE

The ideal criterion against which to measure the success of a driver safety program would be the accident rate. However, it is well known that valid data of this type are difficult to obtain and, as this project was meant to be a pilot study, conducted with limited resources, it was determined that the criterion against which current, in-service driver safety programs would be measured, would be the expressed opinions of Army personnel. As a means of acquiring all facets of these opinions, a multiple approach was utilized, involving a questionnaire and two types of interviews.

The Questionnaire

The basic data relating to opinions of various driver safety techniques were collected through the use of a questionnaire. The methods used to encourage safe driving at various Army installations are not standardized. Therefore, to obtain information concerning the procedures in use, commanders and safety personnel at different types of Army installations were contacted. They submitted descriptions of the methods in use at their installations as well as their opinions as to the value of each of the techniques. This information was analyzed and a list of 37 techniques developed. A questionnaire was then constructed and as one of the items the respondents were asked to: (1) identify the techniques which were used at the installation at which they served prior to their present assignment, and (2) indicate their opinion as to the effect each of the 37 techniques had on reducing the number of accidents. Responses to this item were in a multiple choice format in which the respondent chose between:

1. Very Effective
2. Some Effect
3. Little or No Effect
4. Undecided About the Effect

This evaluation of the safety techniques became one item of the 30 in the questionnaire. Of the remainder, seven were of a demographic nature to establish the age, grade, length of service, marital status, number of children, place of residence, and automobile ownership of the respondent. The other questions were included to obtain opinions about safety inspections, accidents, traffic violations, driver education courses and the type of punishment to be meted out for various offenses. Each of these was presented in a multiple choice format. In addition, there were two free-response questions in which the respondents were encouraged to submit their ideas about improving the driver training program and to make general comments about the accident problem. After the questionnaire was pretested and minor modifications were made, it was submitted to a randomly selected sample of 1,500 officers and enlisted personnel. A total of 865 replies was received.

The Findings

The analysis of the questionnaires disclosed that several safety methods were in common usage and provided a means of comparing them in terms of their adjudged value. More significantly, however, it identified those approaches to the safety problems which were considered to be of little or no value by the respondents. These safety indoctrination techniques could be grouped in the three following broad categories:

1. **Lectures:** by military and civilian authorities, weekly lectures, daily safety talks.
2. **Publications and posters:** post-wide billboards, company safety posters, publication and distribution of monthly safety statistics, use of daily bulletins and publication information and slogans, safety bulletins and other handouts.
3. **Special techniques:** such as the use of closed-circuit television to present safety themes, safe driving talks each month and the use of the post telephone system to provide safety slogans.

Some of the methods judged to have little or no value by the individuals sampled were found to be in extensive use. For example, publications and posters are the most common means of disseminating a safety message. It appears significant that methods which are felt by respondents to be in effective are used with such frequency. More than 80 per cent of the men claim to have been exposed to each of the following practices although they felt that such methods are of little or no value.

1. Use of daily bulletins and publication of safety information.
2. Post-wide billboards with safety slogans.
3. Company safety posters.
4. Safety booklets and other handouts.
5. Publication and distribution of monthly safety statistics.

Considering the money, time, and material involved in the preparation, display and distribution of these particular measures, and in light of their estimated lack of effectiveness, a reappraisal of their value as an efficient means of promoting safety might well be made.

There are also methods listed which are used less frequently than their estimated value indicated as desirable. The use of traffic engineering at their former Army installations, to eliminate trouble spots, was reported by less than two-thirds of the respondents, although they ranked it quite high in effectiveness. However, since traffic engineering is widely practiced at Army installations, these responses would seem to indicate a lack of knowledge of what is meant by the term, traffic engineering. Off-duty driver training courses for offenders are also felt to be effective and are reportedly in use at approximately two-thirds of the installations. NCO councils reviewing offenses to determine punishment are found at only 10 per cent of the installations, although they are thought to be of value by the majority of men.

Overall, the methods felt to be most effective in reducing the number of accidents are those involving *close control over the individual and his automobile*. This includes strict enforcement of traffic rules, mandatory vehicle inspection, allowance of only safety inspection cars on post, usage of traffic engineering methods, strict disciplinary action against traffic violators, and liability insurance as a requirement for registration on post. In addition, the men are very favorable toward certain methods from which they received practical and specific information. These methods included special instruction for driving in bad weather, and off-duty driver training for violators.

The results obtained from the questions concerning a more formal type of driver safety instruction have special significance. When the men were asked if they would be interested in attending a short course in driver education, if it were given during their off-duty hours, less than one-third evinced any interest.

Q. Would you be interested in attending a short course in driver education if it were given in your off-duty hours?

	Per cent
Yes	30.6
No	69.4
	100.0

When the title of the course was slightly modified the response pattern changed as follows:

Q. Would you be interested in spending some off-duty time attending a short course which covered safe driving and automobile maintenance?

	Per cent
Yes	52.8
No	47.2
	100.0

These two tables make clear the fact that, while less than one-third of the respondents are interested in attending a course in "driver education" during their off-duty hours, slightly more than one-half say that they would like to attend a course in "safe driving and automobile maintenance" given under the same conditions. The men seemed to be more interested in learning the specifics

covered in the latter course than the generalities indicated by the title "driver education." When the data were analyzed with reference to age, grade, and marital status, these findings resulted: younger men are more interested in attending such courses than are older personnel; officers would be less likely to attend such courses than enlisted men; and, single men are more willing to give up their off-duty time for the purpose of safety instruction than are those who are married. The responses to these questions have certain implications to safety personnel in that they point out the importance of the wording of the title of a driver training course. The content of each of these courses could be much the same and yet the term "automobile maintenance" is enough to attract many individuals who would not otherwise be interested in attending.

Another section of the questionnaire which produced findings of considerable interest was that dealing with the type of punishment to be meted out to the military men who violate a civilian traffic law. This has long presented a problem to installation commanders. To determine how the soldier in the field feels about the type of punishment appropriate to the various traffic offenses the following question was asked:

Q. "If a soldier from your organization had broken the law in one of the following ways, and *had been arrested and fined by civilian authorities,* which of the punishments listed for each violation do you think he should receive from the Organization commander?

(Answers to this question will be found in Table I.)

Although there is no way in which the above recommendations may be compared with actual practice, certain observations may be made. A large portion of the men recommend "remedial driver training" regardless of the severity of the infraction being considered. This would indicate that programs of this type in effect at the various installations are favorably regarded by servicemen. One possible punishment which received little mention in any of the four situations considered is "restriction to the Post for two weeks." This indicates that such restriction is probably an inadequate means of puishment. Another point of interest is the fact that a high percentage of the men recommended that *no* action be taken by organization commanders following lesser infractions. Even in the case of excessive speed and drunken driving, there were men who felt no command action should be taken.

Those responsible for safety will find it interesting that, as the severity of the infraction increases, a larger number of persons feel that command action is appropriate and that not one of the punishments listed is adequate in itself. By comparing the number of responses under each violation with the total number of persons in the study, it can be seen that for the parking violation there were three per cent more responses than persons in the survey; in the case of minor speeding, there were 14 per cent more; for grossly excessive speeding, 72 per cent; and, in the case of drunken driving, more than twice as many, 102 per cent. Men apparently desire strict enforcement of traffic regulations, and the imposition of increasingly severe penalties as the violation becomes more serious.

Table I

A. A Parking Violation

	Per cent
None	65.0
Official Reprimand	15.5
Driver Training Course	13.3
Two Week Restriction	3.8
Loss of Car for Two Weeks	2.6
Loss of Post Tags (one month)	2.0
One Grade Reduction	0.6
Loss of 1/3 to 2/3 of a Month's Pay	0.2

B. Driving 35 MPH in a 25 mph Zone

	Per cent
Driver Training Course	34.4
None	24.9
Official Reprimand	20.1
Loss of Post Tags (one month)	11.4
Loss of Car for Two Weeks	11.1
Two Week Restriction	9.4
One Grade Reduction	1.5
Loss of 1/3 to 2/3 of a Month's Pay	1.2

C. Driving 70 MPH in a 25 mph Zone

	Per cent
Loss of Post Tags (one month)	31.9
Driver Training Program	30.9
One Grade Reduction	30.9
Official Reprimand	19.2
Loss of Car for Two Weeks	18.8
Two Week Restriction	15.5
Loss of 1/3 to 2/3 of a month's pay	15.4
None	8.9

D. Reckless Driving While Under the Influence of Alcohol

	Per cent
One Grade Reduction	61.7
Loss of Post Tags (one month)	31.5
Driver Training Course	27.5
Loss of 1/3 to 2/3 of a Month's Pay	24.9
Loss of Car for Two Weeks	16.8
Two Week Restriction	16.6
Official Reprimand	16.5
None	6.5

THE STRUCTURED INTERVIEW

This data gathering technique was designed to furnish information which would augment the findings of the questionnaire. It was developed to permit the interviewers, members of the Department of the Army Military Personnel Management Teams, to probe for the more deep seated attitudes concerning the role of the automobile in the frame of reference of the soldier. The interview had 66 items and was normally completed in about one hour. Three hundred and fifty officers and enlisted men were interviewed. While a great deal of information was obtained by this means, the most interesting finding concerned the peculiar ambivalence displayed by the respondents in regard to driver safety programs.

When men were asked if they thought safety campaigns were worthwhile, the majority agreed. When asked what should be stressed in the course of a safety class, many recommendations were made. Most commonly mentioned were courtesy and respect for the other driver, the need for alertness while driving, knowledge and obedience of the law, the danger of speeding and drinking, and the importance of keeping the car in sound mechanical condition.

In contrast to these idealistic expressions, when the men were asked to indicate what they themselves would like to know about safe driving habits, 55 per cent said, "nothing." Most men apparently feel that accidents will not happen to them, that they are superior drivers. Although almost all men endorse traffic safety programs, and had suggestions as to what is important; they intimate that safety programs are for the other fellow, that they know all they need to know.

It is significant that a large percentage of the Army personnel questioned in the study favor a policy whereby the authorities are tough with every offender. They are in favor of unmarked police cars and radar traps. Nevertheless, their answers expressed the idea that this emphasis on law enforcement is really for other people and of no real concern to them. More than 90 per cent said that there are no traffic rules or regulations which they regard as being useless or inappropriate. Yet, when asked to report on their own conduct in connection with traffic laws, which they endorsed, and traffic endorsement, which they wanted to see strict, more than one-half admitted that they personally broke some of the laws if they felt thay were *not* going to be apprehended. They also admit to exceeding the mileage limitations on passes, and driving all night to get back from a leave or pass.

TABLE II

Number	(852)	(87)	(140)	(210)	(154)	(116)	(79)	(66)
Accidents Reported	Total %	20 and below %	21-23 %	24-28 %	29-34 %	35-39 %	40-44 %	45 and over %
None	81.0	75.9	73.6	76.7	79.4	91.4	92.4	90.9
One	14.7	16.2	17.9	19.5	17.5	7.8	6.3	6.1
Two	3.1	3.4	7.1	3.3	1.9	—	1.3	3.0
Three or more	1.2	4.5	1.4	0.5	1.2	0.8	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The picture presented by the responses to the interviews is not encouraging: The men illustrated a real lack of understanding as to the incongruity of their position on safety matters. They favored the extensive use of traffic safety programs and have many suggestions concerning what should be taught in training programs. Still, to the majority, these programs are "for the other fellow" who, in their mind, lacks their superior driving skill. The men claim to believe in a strict enforcement of traffic rules, but feel that they, themselves, are not rigidly bound by these rules. This feeling of being "above the law" in matters of traffic safety presents a problem which warrants further research.

To examine the accident record of the groups and as part of the background data obtained during the course of the interviews, the men were asked:

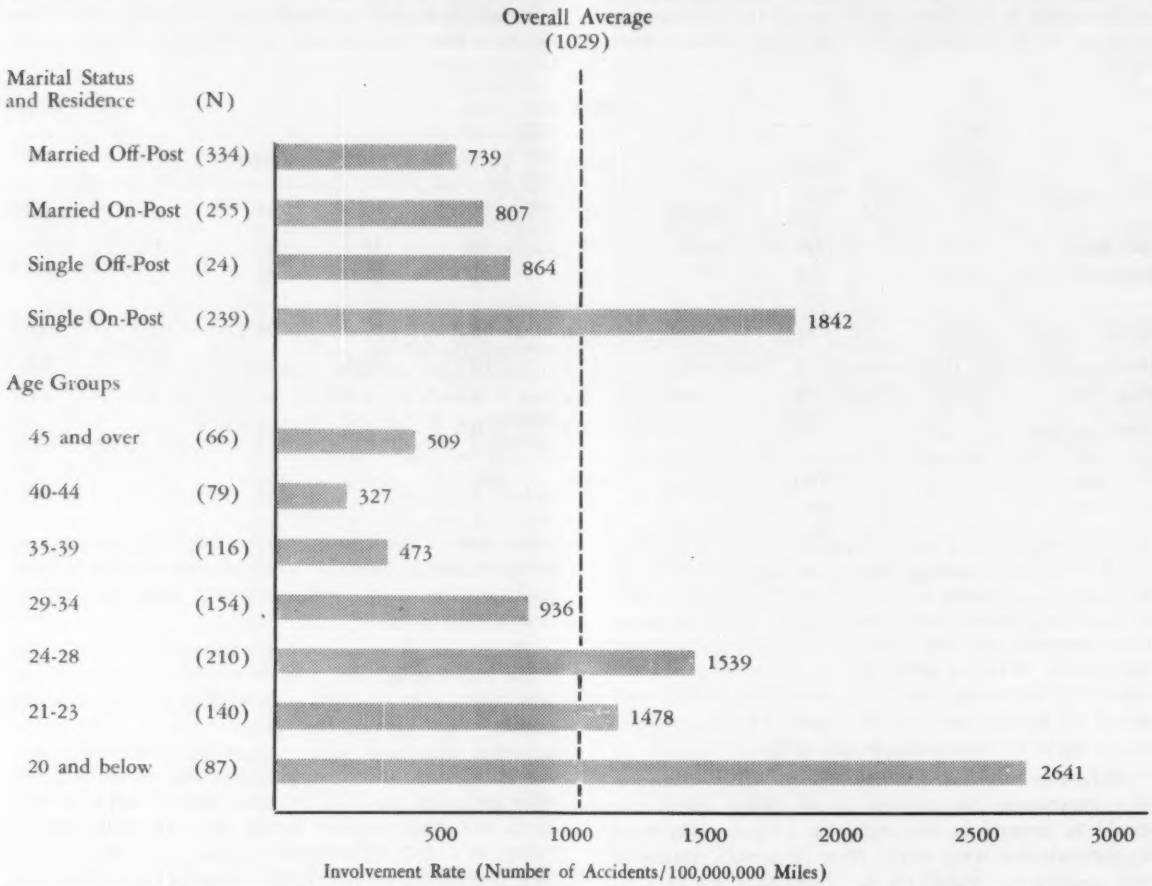
Q. "How many accidents have you had while driving non-military vehicles during the last three years?"

The responses, tabulated in reference to the age of the interviewees, may be found in Table II.

Data in Table II reveals the following:

1. One-fifth of all respondents have had one or more accidents in the past three years;
2. There is a trend for younger men to be involved in more accidents than those in the older age groups;
3. Of those reporting accidents, one-fourth report that they have had more than one accident in the past three years;

Involvement Rate for Sample Subgroups Based on Age, Marital Status, and Place of Residence



4. The group in which the highest percentage have been involved in accidents is that group composed of young, single men, living on-post. This is also the group least likely to have their cars registered on the post. To magnify their involvement rate is the fact that some of this group probably have not had their driver's licenses for three years and, therefore, the number of accidents in which they have been involved does not represent what would be experienced over a full three year period of exposure.

When these facts are compared with conclusions drawn in other studies conducted to investigate the human factors involved in highway accidents, it will be observed that there is a high degree of similarity. Although most studies attribute higher accident rates to younger drivers, some also point out the factors which explain the variance in accident rates based on age differences. While the younger drivers are involved in more accidents per mile, the amount and kind of exposure must be considered. Studies indicate a much higher percentage of the driving by young people is done during the evening and early morning hours, when conditions are more hazardous. Younger people, especially in the Army, probably drive longer distances at one time, thereby increasing their fatigue, which is considered to be an important contribution to accidents. Furthermore, young people are more likely to drive in bad weather, when road conditions are poor.

The figure below is an attempt to clarify these facts by presenting the comparative involvement rates of the different Army groups. The involvement rate is determined by computing the number of accidents in which the group theoretically would be involved in 100 million miles of

driving, based on the reported number of accidents relative to their reported number of miles driven. The use of the involvement rate allows more standardized comparisons to be made among the various subgroups of the Army sample.

This figure demonstrates graphically those conclusions already stated, i.e., increased age, marriage, and living off-post all tend to decrease the involvement rate.

These findings are in substantial agreement with those reported in other studies concerned with accident rates among civilian as well as military personnel. It has been found that the involvement rate among off-duty military personnel is approximately double that of civilian drivers. Previous studies have reported the rate for military personnel to be 440 for daytime driving and 1,200 for driving done at night. Since servicemen do much of their driving at night, the figure of 1,029 arrived at in this study for the combined day and night rate may be considered to be substantially correct.

THE CLINICAL INTERVIEWS

To examine the problem from yet another viewpoint, five soldiers who were patients in an Army hospital as the result of automobile accidents were interviewed by an officer trained in the field of clinical psychology. In these interviews the officer attempted to evaluate the personality structure of each of the soldiers and to determine the part this personal variable played as a causative factor in the accident. The interviews were conducted in the hope that they might furnish new ideas concerning the best means by which motor vehicle safety information could be disseminated.

The fact that each of the soldiers interviewed had recently experienced a serious vehicle accident requires a cautious interpretation of their comments. These men represented a fractional part of the Army driver population and there is no basis for believing that their views are representative of the Army. For this reason, any changes to existing practices recommended by this group or a group of this type must be critically examined. The chief value to be realized from clinical interviewing will not be in the criticism of the existing safety programs but as a means of determining where the existing structures do not meet the needs of a particular group and how they should be supplemented to reach those who presumably are not being reached by the methods currently in use.

The results of the interviews showed the soldiers to vary widely among themselves as to the degree to which they realized their own responsibility for the accident in which they were involved. Despite these differences, however, each of the men seemed personally immature. Little was gained from the interview in the form of worthwhile suggestions. However, they did serve to raise the question as to whether individuals with a general lack of personal organization along with a willingness to be a pawn of circumstance can ever really be reached by a safety program. If this group is to be successfully approached, further research must be devoted to the problems of interpersonal communication. Here the problem of the self-relevance of the material is critical. How can a safety message be communicated so that the recipient realizes it is in reference to his own driving, not to some hypothetical group he calls "other people?"

SUMMARY

The data used in this report were obtained from two sources: (1) a questionnaire presented to a randomly selected sample of 1,500 officers and enlisted personnel, and (2) interviews with a representative sample of 350 officers and enlisted personnel. In addition several soldiers, hospitalized as a result of automobile accidents were interviewed as a trial effort to determine if any particular personality pattern might be common to individuals with automobile accident experience.

The results of the analysis of both questionnaires and interviews indicated that the participants in the study favored a firm, straightforward safety program. When the respondents were asked for their suggestions as to how a traffic safety program could be improved, the three prevalent comments were:

1. Penalties for violations should be stiffer.
2. Traffic laws should be enforced firmly.
3. Inspections should be frequent and thorough.

These and numerous other comments indicate that Army personnel feel the best way to curtail careless driving and to reduce the accident rate is to "get tough" with offenders. Although this general attitude seems to give Army safety personnel and commanders a charter to "tighten up" their safety program, it must be kept in mind that the respondents indicated that the need for a firm policy stems from the actions of "other" drivers, seldom or never from their own behavior. This type of response points to the fact that the key question for future research lies in the area of interpersonal communication. How can individuals be made to realize that safety messages apply to *them?*

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Final Report—Survey of Seat Belt Use Among Motor Vehicle Fleet Operators National Safety Council Members

Prepared by
Traffic Operations Division
National Safety Council

INTRODUCTION

Late in 1958, the National Safety Council announced a National Educational Program aimed at stimulating the use of automotive safety belts. Sponsors of this joint program, in addition to the Council, are the United States Public Health Service and the American Medical Association.

During the initial phase of this educational program, a major effort is being directed at stimulating the use of safety belts by staff and membership personnel of the three sponsoring organizations. The magnitude of the Council's responsibility in this phase is indicated by the 13-18 million people who can be reached through the 9,257 members of the Council.

The purposes of the survey described in the following pages were:

1. To assay the extent of safety belt usage among Council members operating fleets of motor vehicles.
2. To compile general information on the use of safety belts for use in planning the National Educational Program.

This report covers the survey of all Council members and the Council is sincerely appreciative of the cooperation of the hundreds of organizations who by submitting questionnaires, have made this survey possible.

SUMMARY OF SURVEY DATA

Listed below are the principal results and conclusions drawn from the survey data. Each of these is discussed and analyzed in the following sections of this report.

I. Results

A. Of the 1,438 useable questionnaires returned, 513 respondents indicated that some or all of their passenger cars and/or commercial vehicles were equipped with safety belts.

B. Of the 1,279 passenger car fleets reported, 508, or 40.0 per cent, indicated that some or all of their vehicles were equipped with belts. Of the 1,238 truck fleets, 133, or 10.8 per cent, indicated that some or all of their vehicles were equipped with belts.

C. Of the total sample of 184,018 motor vehicles, 47,539, or 25.8 per cent are equipped with safety belts.

1. 43.2 per cent of passenger cars are equipped with belts.

2. 10.9 per cent of commercial vehicles are equipped with belts.

D. Respondents from fleets not equipped with safety belts gave the following *principal* reasons why their vehicles were not so equipped:

1. Low speed, multi-stop urban type of operation..... 29.7 per cent
2. General indifference, lack of interest—apathy..... 12.0 per cent
3. Not convinced of value of safety belts. 15.2 per cent

E. Respondents from fleets equipped with safety belts gave the following principal reasons they attribute to drivers accepting and using the belts:

1. Drivers themselves already realize value of belts ..... 16.8 per cent
2. General educational program.....40.4 per cent
3. Accidents involving drivers, personal contact..... 10.4 per cent

II. Conclusions

A. It is evident from a comparison of the results of this survey with a previous survey, that there is a growing use of safety belts among National Safety Council members operating motor vehicle fleets.

B. While the acceptance of belts by drivers also is increasing, there is still room for improvement.

C. Cost of belts does not seem to play an important role in the decisions of managements who have not equipped their fleets with belts.

D. There is a definite need in safety belt programs to point up the advantages of safety belts in low speed urban motor vehicle travel.

E. There is also a need in programs to emphasize the economic savings to firms through reduction of injuries and fatalities.

SURVEY METHODS AND PROCEDURES

I. Questionnaire

The staffs of the Industrial, Traffic, and Motor Transport Departments of the Council cooperatively devised the survey form. A copy of the questionnaire appears in the appendix of this report. The form sent to Motor Transport people was slightly different, but for all practical purposes was the same as the one shown in the appendix.

II. Survey Sample

About 10,000 survey forms were mailed to Council members. Although a large percentage of Council members responded to the survey, no attempt was made to ensure a random sample. Thus, the results of the survey must be used with discretion.

Five other Industrial Sections were surveyed previously and another survey form was used to obtain information on the use of seat belts. For this reason, the results of these five sections' responses are not included in the completed analysis. However, the results from these sections are included in the over-all analysis on page five.

III. Returns

The information on the following pages is based on a total of 1,438 responses involving the following number of vehicles and fleets:

1,279 fleets	85,156	passenger cars
1,238 fleets	98,862	trucks (A negligible number of transit vehicles is included in this total.)
Total	184,018	

The survey forms were filled out for the most part by safety supervisors and directors and were tabulated and analyzed by the Council's Traffic Operations Division.

RESULTS AND DISCUSSION

I. Vehicles Equipped With Safety Belts

A. All Vehicles

Total Responses	1,438
Total Vehicles	184,018
Number Equipped With Belts	47,539
Per cent of Vehicles With Belts	25.8
Per cent of Fleets With Belts	35.6

TABLE V — Analysis of Seat Belt Use By Section

Section	Number of Respondents	Fleets				Vehicles					
		Passenger Cars		Trucks		Passenger Cars			Trucks		
		Flts Rptd	No. W/B	Flts Rptd	No. W/B	Total	W/B	% W/B	Total Reprt.	W/B	% W/B
Aerospace	25	24	8	24	5	447	170	38.0	483	49	10.1
Air Transport	8	5	1	8	1	130	6	4.6	1235	4	0.3
Automotive & Mach. Sh.	98	88	37	76	8	9804	3491	35.6	2113	86	4.0
Chemical	100	92	37	81	9	5550	2726	49.0	3828	456	11.9
Coal Mining	7	7	4	5	1	323	214	75.0	430	1	0.2
Construction	56	54	19	52	7	1128	236	20.9	4224	84	2.0
Electrical Equipment	64	58	18	55	3	835	64	7.7	695	8	1.1
Food & Beverage	121	98	35	114	4	7226	2135	29.5	11202	81	0.7
Fertilizer	26	21	6	23	1	688	202	29.3	198	1	0.5
Marine	34	32	2	27	1	295	6	2.0	290	1	0.3
Meat Packing, etc.	27	22	3	25	1	4644	1726	37.2	4270	1980	46.4
Metals	151	131	43	125	6	5160	3815	74.0	4123	1362	33.0
Mining (Noncoal)	65	55	22	58	9	1064	731	68.6	1932	98	5.1
Petroleum	69	68	38	65	15	14847	5942	40.0	13814	1718	12.4
Power Press & Forging	30	22	5	26	1	2489	483	19.4	562	20	3.6
Printing & Publishing	20	16	2	17	0	95	23	24.2	86		
Public Employee	32	31	10	30	4	3138	1174	37.5	6703	1439	21.5
Pulp & Paper	186	162	70	145	9	3036	1902	62.7	1954	125	6.3
Railroad	42	38	6	40	1	1191	168	14.1	4808	10	0.2
Merc. & Ware, Rest & Htl	11	11	5	10	1	130	28	21.5	1502	2	0.1
Wood Products	59	53	25	56	5	753	249	33.0	3980	1533	38.5
Motor Transport	207	191	112	176	41	22183	11257	50.8	30430	1733	5.6
Totals	**1438**	**1279**	**508**	**1238**	**133**	**85156**	**36748**	**43.2%**	**98862**	**10791**	**10.9%**

Five Sections Previously Surveyed

Section	No. of Reptd.	Total Vehicles	No. Fleets W/B	No. Vehicles W/B	% Vehicles W/B
Cement, Qury & Mrl Agg	101	2014	37	556	28.0
Glass & Ceramics	56	1065	7	226	21.0
Public Utilities	157	39239	52	1830	4.7
Rubber	35	1395	8	135	9.7
Textile	62	667	10	60	9.0
Totals	411	44434	114	2807	6.3%

B. **TABLE I — Passenger Cars**

	Total	Number With Belts	%	Number Without Belts	%
Fleets	1,279	508	40.0	771	60.0
Vehicles	85,156	36,748	43.2	48,408	56.8

The average fleet size was 134 for passenger car fleets totally or partially equipped with belts, as opposed to an average size of 21 passenger cars for fleets unequipped.

C. **TABLE II — Trucks**

	Total	Number With Belts	%	Number Without Belts	%
Fleets	1,238	133	10.8	1,105	89.2
Vehicles	98,862	10,791	10.9	88,071	89.1

Average size of the fleets totally or partially equipped with belts was 209 trucks, as opposed to 64 trucks for fleets unequipped.

See below for complete analysis of seat belt use by section.

II. Usage of Belts By Drivers

A. TABLE III — Optional *versus* Required Use

A large majority of the 513 respondents reported that the use of belts by drivers was optional (see Table below).

	% of Total Fleets
Optional Use	61.9
Required By Company Policy	27.9
No Answer	10.2
TOTAL	100.0

B. Degree of Usage of Belts by Drivers

In answer to the query concerning driver use of safety belts, the following tables provide a general idea of driver conviction of the importance of the belts. The query makes up question six of the survey form.

The first table is given for the Motor Transport Section. This Section used a form different from the others, in that it asked for driver use of belts for urban and rural type transport combined.

TABLE IV — Driver Use of Belts — Motor Transport Section

Drivers Use Belts:	Responses	%
Always	44	38.1
Sometimes	49	42.1
Seldom	17	14.6
No Answer	6	5.2
	116	100.0

The second and third tables are given for the Industrial Sections reporting with the survey form. The tables are for urban driving (VI) and for rural driving (VII).

TABLE VI — Driver Use of Belts — Urban Driving

Drivers Use Belts:	Responses	%
Always	131	33.3
Sometimes	126	32.0
Seldom	89	22.6
No Answer	48	12.1
	394	100.0

TABLE VII — Driver Use of Belts — Rural Driving

Drivers Use Belts:	Responses	%
Always	245	62.0
Sometimes	79	20.0
Seldom	25	6.3
No Answer	47	11.7
	396	100.0

C. Methods of Obtaining Driver Acceptance

The various means of obtaining driver acceptance of safety belts appear in the table below. The percentages are based on the answers of 259 safety supervisors and directors who had obtained a good measure of driver acceptance. See question seven of the survey form.

TABLE VIII — Driver Acceptance Methods

Method	Responses	% of Total
General Education Program	105	24.3
No Problem—Belts Requested by Drivers	45	10.4
Use of Belts Required by Company	27	6.5
Accidents Involving Company or Other Drivers which Demonstrated Value of Belts	21	4.7
Personal Contact	15	3.5
Use of Films	4	0.9
Other	42	9.7
No Program	173	40.0
	432	100.0

D. Reasons Why More Fleets are Not Equipped with Belts

The table below lists reasons why fleets had not been equipped with belts. 307 respondents answered question nine of the Survey Form which asked for the primary reasons why a fleet was not equipped with belts.

TABLE IX — Reasons for Nonequipped Vehicles

Reasons	Responses	% of Total
Low Speed, Multistop Urban Operation	74	20.0
Not Convinced of Value	38	10.3
General Indifference, Apathy	30	8.1
Unable to Enforce Use	17	4.6
Cost	13	3.5
Low Accident Rate in Past	12	3.2
Other	123	33.2
No Answer	63	17.1
	370	100.0

APPENDIX

SURVEY QUESTIONNAIRE

SAFETY BELTS IN COMPANY OPERATED PASSENGER CARS AND TRUCKS

The National Safety Council is currently sponsoring a National Educational Program aimed at stimulating the use of safety belts. Other sponsors of the program are: The U. S. Public Health Service and The American Medical Association.

In the initial phase of this program, its sponsors are attempting to compile information on the usage of belts among their members. Thus, we shall very much appreciate your time and effort in filling out and returning this questionnaire.

Company Name_____
Address_____
Nature of Business_____

1. **Total number of motor vehicles in your fleet** Passenger Cars_____ Trucks_____
2. **Total number of motor vehicles equipped with safety belts** Passenger Cars_____ Trucks_____
3. **If none of your vehicles is equipped with safety belts, has installation been considered?** Yes ____ No ____
4. **If your company vehicles are not equipped with safety belts, do you have any plans for equipping them in the future?** Yes ____ No ____
   (If the answer to either of the two previous questions is no, the only other applicable question is #9.)
5. **Is the use of belts by drivers optional?** ____; **or is it required by company policy?** ____. **(Please check one.)**
6. **Would you say that the majority of your drivers who have safety belts use them? (Please check the two appropriate boxes.)**

	MOST OF THE TIME	SOMETIMES	SELDOM
a. URBAN DRIVING			
b. RURAL DRIVING			

If you choose only to answer the above questions, you will have furnished us with the statistical data we need. However, if you wish to help us in the interpretation of our data and in planning our programs, your answers to the questions below will be most helpful.

7. **If you have obtained a good measure of driver acceptance (i.e., drivers use safety belts sometimes—most of the time) what effective methods have you used to encourage your drivers to use their belts?**
   _____
   _____
   _____
8. **If you have not obtained a good measure of driver acceptance (i.e., drivers seldom use their safety belts) what do you feel is the principal reason?**
   _____
   _____
   _____
9. **If you have considered equipping your fleet with safety belts and have not done so, what were the prime considerations influencing your decision?**
   _____
   _____
   _____
10. **Is is likely that the National Safety Council will wish to quote some of these returns in future publications. May we have permission to use the information in this report in such a manner?** Yes ____ No ____

Any additional information or comments on the subject of safety belts you may wish to submit will be very valuable in our program work. We are particularly interested in accident case histories involving safety belt users and the effect of safety belts on injury rates.

Signed_____
Title_____

The Relationship of Scholastic Achievement To Traffic Citations in the Seattle Public Schools

by John E. Corbally and Mark M. Knoll

There is a general acceptance on the part of the public that the teen-age driver has become a problem. While people firmly believe this and think that driver education is a requisite for all teen-agers who drive a car on the public highways, there seems to be a difference of opinion as to who should do the instructing, when it should be done, and where. Some think the instructing should be done by enforcement agencies. There are still others who think it should be conducted after school hours and during vacations. There are others who believe that driver education is one of the most important subjects a young person can take in school and that there can be no better place for a teen-ager to learn the responsibilities of living.

Driving a car has probably been the first and most important time the teen-ager has come in contact with an adult responsibility. It comes at a time when he is too old to be a child and not old enough to take an adult's place. The results of this submerged personality have not always shown the teen-ager to his best advantage. Onlookers have examined this problem and passed judgments which have not been backed by investigation or understanding.

It has been the privilege of one of the authors to serve as instructor of driver education at five of the nine high schools in Seattle. In these schools, some 2,500 students have been enrolled in driver education courses taught by the author. These students have been both high and low scholastically, and have come from homes representing a cross-section of the school patronage.

It has been the experience of this investigator, in dealing with students in his classes, that all need training in traffic behavior. Their problems are alike in most instances. As a subject for study, driver education must submit to the same evaluating techniques as other school subjects. Since the responsibility of such study rests in part, on the instructor, this investigation was undertaken to determine the validity of the investigator's assumption that there is little relationship between scholastic achievement and traffic violations and citations. There is a secondary purpose, namely: directing attention to other areas where research should be done with respect to traffic problems. This study like others has its limitations, of which there are at least three: The area was limited to violations by students in the Seattle public high schools; the number of violator records was not sufficient to be conclusive, and grade-point averages alone were used as a measuring device.

SOURCES OF DATA

Permission was granted the investigator by Judge William G. Long of the King County Juvenile Court, to copy from the files of the court the traffic records of Seattle high school students for the year 1957.

There were 309 traffic records selected at random from the court files. Care was taken to have each of the nine high schools in Seattle represented by some cases. The largest number, 75, represented the largest high school, while the smallest number was five, representing a school just opened in the fall of 1957.

The administration of the Seattle Public School System granted the investigator permission to obtain from the various high schools the permanent records of the students involved. The permanent records of 297 of the 309 violators were obtained, and their traffic violation records were compared directly to their grade-point average.

The records of the Juvenile Court included the name of the student, his address, race, sex, age, date of birth, school, name and address of parents, violations of the offender and date of offense, and whether or not he had taken driver education.

For purposes of this study use was made of the name of the student, the violations and school in which he was enrolled.

It should be noted that a violation referred to the offense, while a citation was the instrument issued at the time of offense. In many cases there were several violations to a citation.

The Director of the Traffic Violations Bureau of the city of Seattle was consulted, and each violation was weighed according to severity, one point being the least severe, three points the median, and five the most severe.

The permanent records of the violators, obtained from their various schools, were used to figure grade-point averages. These were figured to two places with no attempt being made to weigh subject matter. The students were then listed according to grade-point average and divided into six groups. They were then matched with their violation and citation records. There were 39 students with grade-point averages of 0.00 to 0.99; 84 with grade-point averages of 1.00 to 1.49; 70 with grade-point averages of 1.50 to 1.99; 60 with grade-point averages of 2.00 to 2.49; 28 with grade-point averages of 2.50 to 2.99; 16 with grade-point averages of 3.00 or better, totaling 297 cases.

From the information available, eight tables were developed. Table I shows a partial list of traffic violation scores of 297 students from nine Seattle high schools. The first column of the table lists the nature of the violation as listed in the Seattle Traffic Code. The second column contains the traffic code number with a superscript which

designates the points charged against it. The next nine columns are individual schools with the number of violations in each category charged against that school. Weighted points are designated by the super-scripts. The final column carries the total number of violations and violation points.

A summary of the traffic violation scores of the 297 individuals studied is shown in Table II. They were guilty of 826 violations carrying a violation penalty of 2,850 points.

Seven different violations were charged once and 27 charged five times or less, while there were 10 charged 20 or more times. Speeding was first on the list with 232 cases; this was followed in order by negligent driving, 85 cases; loud mufflers, 84 cases; disregarding traffic signals, 29 cases; no registration, 28 cases; under-age driving, 26 cases; illegal lane change, 24 cases; stolen cars, 21 cases; and 20 cases of illegal use of lights.

The average number of violations per student was 2.78. The average number of points per violation was 3.45. The lowest number of violations per student was 2.16 for 13 students. The highest was 2.89 for 69 students. The points per violation was 3.60 for the 13 students and 3.57 for the 69 students. This would seem to indicate that the size of the sampling has a great deal to do with the results obtained except in number of points per violation.

average citation was 1.89 per student. There were 2.69 violations per student with an average of 3.26 points per violation. The student average violation per citation was 1.40, while the average points per citation were 4.62.

Eighty-four students with a grade-point average of from 1.00 to 1.49 made up the second group. The greatest number of individual cases in this study fell in this group. There were 65 cases of speeding and 36 cases of driving without a license or under-age driving. Loud mufflers were the cause of 21 citations; negligent driving appeared 18 times, and stolen cars, 13 times.

The greatest number of violations by one individual in this group was eight with a point total of 28. The greatest number of citations was six.

The records of 70 students whose grade-point averages were between 1.50 and 1.99 were examined. The number of speeding violations in this group was 47, which was slightly higher per student than in the previous group. The number of violations for negligent driving was 22. Loud mufflers were responsible for 26, driving without a license accounted for 15, and stolen cars for six violations.

The balance of the 212 violations of this group was well distributed over the total list of 49 included in the study.

There were 60 students with grade-point averages be-

Table I

Partial Traffic Violation Score of 297 Students From Nine Seattle High Schools

Violation	Seattle Traffic Code Number	Violation Points	Schools									
			A	B	C	D	E	F	G	H	I	Total
Loud Muffler	122	3	1^{3}	24^{72}	9^{27}	11^{33}	11^{33}	16^{48}	9^{27}	1^{3}	2^{6}	84^{252}
Improper Use of Lights	125	3		6^{18}	1^{3}	4^{12}	2^{6}		6^{18}		1^{3}	20^{60}
Illegal Headlights	126	3	1^{3}			1^{3}						2^{6}
Lights Not On	129	3		1^{3}		1^{3}	3^{9}	1^{3}	3^{9}	2^{6}	2^{6}	13^{39}
Defective Equipment	132	1	1^{1}		1^{1}	3^{3}	3^{3}	2^{2}	2^{2}	1^{1}		13^{13}
Unattended Car at Accident	134	5			1^{5}	3^{15}						4^{20}
Hit-and-Run	135	5		1^{5}	1^{5}							2^{10}
Under-Age Driver	171	3	1^{3}	3^{9}	3^{9}	5^{15}	1^{3}	4^{12}	7^{21}		2^{6}	26^{78}
No Driver's License	172	3	1^{3}	12^{36}	4^{12}	2^{6}	11^{33}	3^{9}	8^{24}	3^{9}	6^{18}	50^{150}
Allowing Unlicensed Person to Drive	173	3		2^{6}		1^{3}			1^{3}			4^{12}

TRAFFIC VIOLATIONS AND CITATIONS OF PUPILS BY GRADE-POINT AVERAGES

In the original study, the next six tables showed the records of the individual students by grade-point groupings. A partial sample of one of the groups is shown in Table III.

There were 39 students whose grade-point average was 0.00 to 0.99. In this group the highest number of violations by one student was 10, with a violation point total of 30 for five citations and six violation points per citation. Twenty-three violations of speed were found, 10 of negligent driving, and nine instances of stolen cars. The other violations were fairly well distributed.

Twenty-two of the 39 students had one citation. The

tween 2.00 and 2.49 involved in 175 violations. They were charged with 617 violation points collected in 131 citations.

The greatest number of violations by one person in this group was eight with a violation point score of 24. The greatest number of citations was five.

Speeding was once again the leading offense with 49 cases, which was followed in order by negligent driving, with 16 cases; driving without a driver's license, 13 cases; and loud mufflers, eight cases. There was one stolen car by a student with a grade-point of 2.00.

The records of 28 students with grade-point averages ranging from 2.50 to 2.99 were tabulated. The greatest number of violations by one student in this table was five, with a point total of 21. Five was also the greatest number

Table II

Summary of Traffic Violation Scores of 297 Students From Nine Seattle High Schools

	A	B	C	D	E	F	G	H	I	Total
SUMMARY										
Total Violations	28	200	82	141	89	95	142	11	38	826
Total Violation Points	101	714	287	480	305	302	500	35	126	2850
Number of Students	13	69	32	46	31	36	49	5	16	297
Violations Per Student V/S	2.16	2.89	2.56	3.06	2.87	2.63	2.89	2.50	2.37	2.78
Points Per Violation V.P./V	3.60	3.57	3.50	3.40	3.42	3.17	3.52	3.18	3.31	3.45

of citations issued to any one individual.

The 28 students committed 59 violations with a score of 209 points. These were earned with 53 citations.

There were 16 cases of speeding, 11 of loud mufflers, six of negligent driving, four of following too close, and two of driving without a license. There were no cases of car theft.

The number of different violations was remaining nearly constant throughout the investigation, regardless of grade-point average.

There were 16 students with a grade-point average of three or better. There were only 16 records in this group, and the violation spread was not as great, but of more consequence. Aside from speeding, there were found such violations as blocking traffic, prohibited turns, negligent driving and following too close. While the violation spread was not as great for this group (probably due to limited sampling), the Director of the Seattle Traffic Violations Bureau held that those violations that did occur were of a slightly more serious nature from the standpoint of accident potential.

SUMMARY OF TABLES IN ORIGINAL STUDY

Table IV was built on the evidence of Tables II through VII inclusive in the original study. Some of the evidence influenced the problem; other evidence created new ones.

It was noted that 39 students with the lowest grade-point had 2.69 violations per student with an average number of points per student of 8.76. This was 3.26 points per violation, the lowest number of points per violation in any of the tables. The greatest number of points per violation, 3.92, was from the 16 students with the highest grade-point.

The students with the lowest grade-point had 1.89 citations per student compared to 1.50 for the highest. The lowest grade-point group had the highest number of violations per citation, 1.40. The high group had 1.08.

The 84 students in the 1.00 to 1.49 grade-point group had the greatest number of violation points per student, 10.47 and 3.55 points per violation. They also had the greatest number of citations of any group, 2.27.

The group 2.00 to 2.49, which was made up of 60

Table III

Traffic Violations and Citations of 60 Students*
With Grade Point Average 2.00-2.49

Grade-Point Average	Violations	Number of Violations	Number of Violation Points	Number of Citations	Violation Points per Citation
2.00	172-50	2	6	1	6.00
2.00	128-180-20-65-50	5	12	2	6.00
2.00	50-46-171-191	4	16	3	5.33
2.00	50-50	2	10	2	5.00
2.00	61-50-125-50-126	5	19	3	6.33
2.00	50	1	5	1	5.00
2.00	54-50-50	3	15	3	5.00
2.00	202-49-46-50-50	5	21	5	4.20
2.00	67-50-129-50	4	16	4	4.00
2.00	50-125-33	3	9	3	3.00
2.00	50	1	3	1	3.00
2.00	63	1	3	1	3.00
2.03	33-172	2	6	1	6.00
2.04	122-118-86-50-50-50	6	24	5	4.80

*Similar tables were compiled for each grade-point category. This sample table lists the records of 14 of the 60 students in this group.

students, had the greatest number of violations per student, 3.52. They also had 2.18 citations per student, which was next to high in this area. This group was found to have the greatest number of violation points per citation. The group of 28 students in the high "C" bracket, 2.50 to 2.99, had the least violation points per citation.

The data showed there was only one item where the lowest scholastic group had a point total higher than the other groups. This was in the number of violations per citation. This score was 1.40 against 1.08 for the high scholastic group.

There was some difference in the type of violation in the different grade-point groups. All of the cars stolen were stolen by students with grade-point 2.00 or lower. This group also had more students driving without a license than groups above 2.00. The low scholastic group also had a greater percentage of reckless driving violations. All groups had about one fourth of the students charged with negligent driving, which was not as serious as reckless driving.

Speeding was more prevalent among students in the higher grade-point group than among students in the lower grade-point group.

The highest number of violations per student (3.52) appeared in the lower "C" group with a grade-point average of from 2.00 to 2.49. Violations of other groups in descending order are as follows: upper "D" (1.50 to 1.99), 3.09; lower "D" (1.00 to 1.49), 2.96; lowest grade-point (0.00 to 0.99), 2.69; upper "C" (2.50 to 2.99), 2.11; highest grade-point group (3.00 to 4.00), 1.62 violations per student. This score was in favor of the student with the high grade-point average. The student with the lowest grade-point average was midway between in the number of violations per student.

The same results were evident in the number of violation points per student. The high scholastic group had 6.49 violation points per student while the group with a grade-point of 1.00 to 1.49 had the highest violation record. Their record was 10.47 violation points per student.

When the number of points per violation was checked, the results were found to be reversed. The low scholastic group had a record of 3.26 per violation, while the high scholastic group had a record of 3.92 per violation.

There were some interesting sidelights other than violations and grade-point averages. Seventy of the students were from broken homes. Twelve of the 297 students were girls. Fourteen of the group were 15 years of age, 137 were sixteen years, and 146 were 17.

Forty-four of the 297 students had one half the recommended six and 30 hours of driver education.[1] Four of this number were girls. The rest of the group, or 253 students, had no driver education.

CONCLUSIONS AND RECOMMENDATIONS

From the data presented, from reading in the field, and from experience, the following conclusions were drawn:

1. While the data showed a difference in the type of violation among the various groups, the difference in the number of violations per student and the number of violation points per student probably were not of great consequence.

2. There is a need for further study in this field.

3. The students in the lowest grade-point group were not the greatest offenders.

4. The students in the highest grade-point group were greater offenders than thought by some.

5. The sampling was limited, but the data in this study tended to point toward support for the hypothesis that were is little relationship between scholastic achievement and traffic citations.

6. The many variables that occur in a study of this kind are hard to control. It does appear that the factors that lie behind the traffic problem are the same that lie behind behavior problems that affect the teacher and student in fields other than driver education.

It is strongly recommended that people interested in the field of safety do extensive research in the field of driver education and its implications in helping solve problems in other fields. A driver education instructor is in a strong position to do a good bit of guidance and needs to have as broad a picture as possible of human nature and the direction of growth.

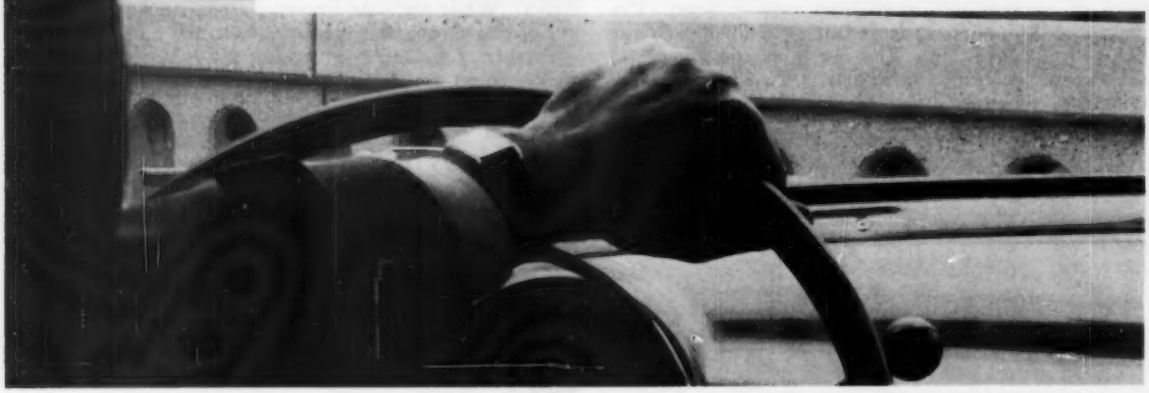
Table IV
A Summary of Violations By Grade-Point Groups

Grade Point	Number of Students	Number of Violations	Number of Violations per Student	Number of Violation Points	Number of Violation Points per Student	Number of Points per Violation	Number of Citations	Citations per Student	Number of Violations per Citation	Violation Points per Citation
0.00-0.99	39	105	2.69	342	8.76	3.26	74	1.89	1.40	4.62
1.00-1.49	84	249	2.96	880	10.47	3.55	191	2.27	1.30	4.60
1.50-1.99	70	212	3.09	700	10.00	3.30	159	2.27	1.33	4.40
2.00-2.49	60	175	3.52	617	10.28	3.52	131	2.18	1.33	4.71
2.50-2.99	28	59	2.11	209	7.46	3.54	53	1.89	1.11	3.94
3.00-4.00	16	26	1.62	102	6.46	3.92	24	1.50	1.08	4.24
Total	297	826	2.78	2850	9.59	3.45	632	2.12	1.30	4.50

[1]Standards of American Automobile Club are six hours of behind-the-wheel and 30 hours classroom instruction.

Driving Records of Accident-Involved Drivers

by H. Laurence Ross



This report reviews the accident and violation histories of the accident-involved drivers who participated in "Experimental Case Studies of Traffic Accidents." In reviewing these histories, three goals are in mind. First, it is desirable to know the kind of official records of traffic law violations and automobile accidents that these drivers possessed before becoming involved in accidents. Put another way, would it have been possible to identify these drivers as likely to become involved in accidents from a knowledge of their official records, prior to the occurrence of the accidents? A second purpose of the report is the comparison of the driving histories established from official records with similar data obtained from interviews, in order to obtain clues as to the reliability of each type of data. The third purpose is a speculative search for reasons as to discrepancies between the official and reported histories.

Method

This report is based on a relatively small number of cases, and is therefore to be taken as suggestive rather than conclusive. The data concern 36 individuals who were involved in accidents in Evanston, Illinois, between September, 1958, and February, 1960, and were interviewed during Experimental Case Studies of Traffic Accidents. These were all the drivers interviewed in the later stages of the project. Earlier cases are not included in the analysis because information was incomplete. One driver interviewed in this period was omitted from the sample because he had an out-of-state driver's license. The remaining 36 were licensed by the state of Illinois at the time of their accidents.

The relationship of this sample to a universe of Evanston drivers is not completely known. The research unit judged the total Case Studies sample to be fairly representative of the universe*, but a separate analysis for these 36 cases was not conducted, on the grounds that the number was too small. However, the only purposeful selection exercised for this group was by date of interview, and it appears unlikely that this procedure contains notable correlated bias. Since all drivers cooperated in the Case Studies interview, the sample as a whole may be more cooperative than the general population.

The drivers interviewed for this analysis were asked to report all traffic violations and all accidents in which they were ever involved. The year and the nature of the incident were recorded. In April, 1960, a list of the license numbers of the interviewees was sent to the Illinois Secretary of State, who provided a transcript of the official record of each driver, including the date and nature of violations and accidents listed in his files, from January 1, 1957, forward.

The following analysis is concerned with the period between January 1, 1957, and the date of the individual driver's accident. Except for two drivers, this period was at least two years long, and, except for one, no more than three years long. The median time elapsed was 28 months. It should be noted, however, that there was no official assurance that drivers had held Illinois licenses during the entire period. This assumption may be erroneous in particular cases, and the period of exposure of the group may be somewhat overestimated.

Official Records of Accident-Involved Drivers

The official record of a driver's accidents comes from a report, which the driver is legally required to file with the Illinois Division of Highways, concerning involvement in any accident "resulting in damage to the property of any

cf H. Laurence Ross, Robert B. Mack, and Mary F. Young, *Method and Sample*, Chapter I, *supra*.

one person in excess of $100, or in death or bodily injury . . ." The official record of violations is transmitted by local courts when they record a conviction.

The 36 accident-involved drivers interviewed for this analysis had, as a group, a very fine official record concerning previous accident experience. Two individuals were on record as each having had one accident between January, 1957, and their interview. The remaining drivers' records were completely free of accidents during this period. Thus, the group as a whole had experienced one officially recorded accident in every 42 man-years of driving. By comparison, in 1958 more than 426,000 accidents were officially reported in Illinois, which has about 4.5 million licensed drivers. Were these accidents distributed randomly over the driving population, a group of 36 drivers could be expected to have more than three reported accidents per year, or one accident for every 10 man-years of driving. It can be concluded that the official records are far from depicting these drivers as worse than average drivers in Illinois. Depiction of this group as "safe" may, to an unknown extent, be affected by the use of state, rather than local, statistics as a base. Relevant information is not available for Evanston.

Only 12 of the 36 had any reported traffic convictions in their official records. Convictions ranged from none to four, with a mean of 1.5 for individuals with a conviction record, and 0.5 for the group as a whole. The number of convictions per year in Illinois is not known, so it is impossible to make a positive evaluation of these conviction records. However, the impression these figures give of the quality of the drivers is not a poor one. Only two drivers had a record of more than one conviction per year, and the mean of the group was less than one conviction per four man-years of driving. Furthermore, the nature of the violations appears minor. The 12 people with violation records had 18 convictions. Ten of these were for speeding, four were stop sign violations, and there was a case, each, of failing to yield right-of-way, improper passing, improper turning, and driving on the wrong side of the road. Thus, while a definitive evaluation cannot be made, the violation record of these drivers, who subsequently were involved in accidents, appears rather good.

In sum, neither the official accident record nor the official violation record of this group of accident-involved drivers seems poor; rather, the impression gained is that of a relatively good group of drivers. It is doubtful that the official records would have led to the prediction that these drivers would become involved in accidents. Findings such as these suggest support for the hypothesis that drivers involved in accidents are not "problem" drivers or "accident-prone" individuals, but rather are ordinary people in occasional difficult situations.

Comparison of Reported and Recorded Accidents

The two drivers in the case study group with officially recorded accidents, both mentioned these accidents in their interviews. But 11 other drivers reported an additional 14 accidents that were not recorded in the files of the Secretary of State. On the surface, this is a rather impressive deficit in the official figures. The following possibilities might be cited to explain the discrepancy:

1. Some of the accidents mentioned in the interview may have been too minor to be legally reportable. To the extent that this reason is responsible for the discrepancy noted above, the value of the official statistics is not decreased, since they are specifically limited to the more serious accidents.

2. Some of the accidents may have occurred outside of Illinois and therefore may not have been reported to Illinois officials. From the point of view of state accident statistics, these omissions are probably acceptable, if out-of-state accidents are systematically omitted. From the point of view of driver records, the omissions are regrettable, but the total potential effect of out-of-state accidents on driver records is probably relatively small.

3. Some license records may have started late, the driver becoming an Illinois resident after having had accidents in other states since 1957. This also appears unlikely to explain large discrepancies between reported and officially recorded accidents and convictions in a sample such as the above.

4. Properly filed reports may have been sidetracked or lost in the processing by various government departments. In the records considered here, the probability of delay appears rather small. The official records were consulted in April, 1960, whereas, with one exception, the information tallied dated from before the previous December. The possibility of loss, or semi-permanent diversion of records in State offices, remains, and may unfavorably affect official statistics.

5. Finally, drivers may have been negligent in making reports. It seems likely that this reason, along with point 1 above, is predominantly responsible for the discrepancy between reported and recorded accidents. Unlike the case of non-reportable accidents, the failure of a driver to report a "serious" accident can undermine the validity of official statistics.

Some evidence concerning the effect of negligence in the reporting of accidents to State officials is available from Case Studies data. Police estimates of damage were available for all participants in the project. On the basis of these estimates, which are felt to be conservative, the obligation of the drivers to report the accidents for which they were interviewed was established. For several reasons it appears likely that negligence in reporting among this sample in comparison to the population is minimal. The accidents were already reported to the local police department. Each driver was interviewed for several hours by the project personnel, so that it would have been hard to pass off the incident as "not an accident." Furthermore, letters handed to all participants mentioned an offer of aid in filing the state form, should it be desired, and the offer was at times repeated during the interview, so that the existence of the state accident reporting requirement was made known to the participants.

Among the 36 participants, it was judged that 25 should have reported their accidents to the state according to the legal requirements. For the remaining 10, police estimates of damage were below the minimum, and reporting would not be required. One case was doubtful because of insufficient information.

Among the 25 people judged obligated to report, only nine had done so, according to the official records. One among those not obliged to report had reported, but since it is felt that the police estimates of damage are conservative, this accident may well have met the state definition of a reportable accident. There thus remained 16 "delinquents," who should have reported accidents and did not, despite circumstances unusually favorable to this reporting.

It is concluded that a large part of the discrepancy noted between these drivers' earlier records (prior to the accident for which they were interviewed in the project) and their reports of previous accidents was due to their failure to

report those accidents as legally required.

This conclusion, insofar as it may represent conditions among the entire population of the state, casts severe doubt on the reliability of data in driver records files, and, by extension, on the official accident statistics.

Comparison of Reported and Recorded Violations

State files officially credit 12 drivers, among the sample of 36, with 18 violations. In the interviews, only nine of these violations were reported. On the other hand, 13 drivers mentioned an additional 16 violations that were not officially tallied. Thus, the picture of violations is more complex than that of accidents. Only nine violations were both reported in the interview and recorded in the official files. Sixteen were reported in the interview only, and nine were officially recorded only.

A surplus of violations reported over violations officially recorded can potentially be explained by points three and four in the list above. All violations are legally reportable, so point one would not be expected to apply. It may be assumed that courts in other states are expected to transmit violation records to the Illinois Secretary of State through their own motor vehicle administration, but error at this point is conceivable. It is furthermore possible that courts in Illinois are delinquent in their reporting to state offices. A surplus of reported over recorded offenses might also result from the error of reporting to the interviewer of citations that were later dismissed or "fixed."

A different kind of discrepancy may result from misreporting of the date or nature of a violation. If the same offense were differently recorded by the State and reported to the interviewer, it would generate two errors in the above data by appearing as one violation reported and not recorded, and one violation recorded and not reported.

Still another source of potential error leading to more reported than recorded violations is inadequate identifying information or conviction abstracts sent by the courts to the state. Some abstracts, lacking complete name or license number, cannot be identified as applicable to any driver. Others, due to misspellings of names and incomplete numbers, may be assigned to the wrong driver.

A surplus of officially recorded violations over violations reported in the interviews could come from a memory lapse of the subject, although the period of recall was relatively short and the violations generally infrequent enough to expect such lapse to be relatively rare. Concealment of embarrassing information from the interviewer is an alternative possibility, as is error in the recording process, crediting a driver with convictions attributable to another driver.

The sources of error are too numerous and complex in this instance to evaluate their relative contribution to the observed discrepancy. It is possible to conclude that serious doubt about the reliability of state records has again been raised, this time with respect to traffic law violations. Furthermore, the presence of violations recorded but not reported in the interviews cast doubt on the reliability of the interview material. Fully half the officially recorded violations were not reported in the interviews.

This material, while based on a small number of cases, suggests by the extent of discrepancies observed, that researchers interested in the driving histories of groups of individuals must conceive of verbally reported and officially recorded events as two overlapping but somewhat independent universes. Research based on the one is not necessarily valid for the other, nor is either necessarily representative of a more ideal universe of perfectly recorded or perfectly remembered events. Which one is to be used in research will depend on the purposes of the research, and the time and cost budget of the research agent. Where the research budget permits, it appears that both types of information should be used. Then, if accuracy of detail is desired in preference to completeness, the overlapping segment of the two universes can be studied. If completeness is preferred, the combined universes should be used.

Summary and Implications

The official records of a group of drivers who were involved in accidents studied in the Experimental Case Studies of Traffic Accidents appear to depict this group as composed of better-than-average drivers. Their accident experience seems better than might be expected by chance, and their record of traffic law violations does not impress one as notably poor. This finding suggests a lack of support for the proposition that accidents tend to involve drivers with consistently poor driving performance.

Official records were found to contain only a small fraction of the accidents reported in interviews. A large part of this discrepancy may be due to negligence of drivers in reporting their accidents. Likewise, only a small part of traffic law violations admitted in interviews appeared on official records, but on the other hand, many violations appearing in the records were omitted from the interviews. These findings cast serious doubt on both official records and interview reports as sources of information of driving histories. It is suggested that both sources used together may provide a more valid set of data both in the case where accuracy of detail is desired and in the case where completeness is desired.

The findings reported here must be interpreted with caution. The sample of drivers studied was small and not necessarily representative of the broader driving population, and the records of only one state were used. On the other hand, Illinois records are generally considered to be among the best in the United States. Furthermore, considering both the general socio-economic characteristics of drivers in the Evanston area and the circumstances surrounding the interview in Experimental Case Studies of Traffic Accidents, it is probable that these drivers were less likely than most to under-report their accidents and law violations.

Insofar as these findings represent accident and violation records in general, as confirmed by future study, there would appear to be severe limits on the usefulness of such data for both research and practical purposes. The use of these records as the basis of a point system for the revocation of licenses appears questionable, although, in the lack of anything else, it may have to do. It would certainly appear inadvisable to use such records as the basis of granting reductions in insurance premiums, as has been suggested. The findings of research based exclusively on either reported or recorded offenses should be scrutinized closely with the question in mind of the effect which bias in reporting and recording may exert. The very small differences between groups typically reported in research in our field could easily be attributable to such bias.

The findings of this small study demonstrate a need for extensive research on the nature of traffic statistics, as most of the scientific material in traffic safety is of a statistical nature, or has a statistical basis. If such research supports the conclusions offered here, officials of the various states should recognize the need for gross improvement in their methods of receiving and processing information on accidents and violations.

A Study of the Relationship of Street Level Carbon Monoxide Concentrations to Traffic Accidents

George D. Clayton, Warren A. Cook, and W. G. Fredrick

INTRODUCTION

In Germany and the Scandinavian countries, investigators have published extensive observations concerning carbon monoxide exposures insufficient to cause subjective symptoms but which, they report,[1,2] have affected the cardiovascular, endocrine and respiratory systems, the blood and the central nervous system, causing in the latter disturbances of vision and hearing, speech and the reflexes. Since a disturbance of vision and reflexes could be factors influencing traffic accidents, a research project was begun in 1956 to determine whether carbon monoxide as an atmospheric pollutant may have a sufficient effect on the individual driver in urban areas to exert a casual influence on automobile accidents. Concurrently, a second objective of the study was to determine what atmospheric and other conditions would be necessary to create excessive concentrations of CO in the atmosphere. The study was conducted under the auspices of the University of Michigan and the National Sanitation Foundation.

ORGANIZATION

In order to have capable guidance in the several areas of this investigation and to assure cooperation on the basis of a knowledge of the whole project, an advisory committee was established. This committee included: Commissioner of Health, City of Detroit; Director, Department of Streets and Traffic; Commanding Officer, Accident Prevention Bureau, Detroit Police Department; Representative of Automobile Manufacturers Association; Director of Laboratories, Detroit Receiving Hospital; Medical Director, Mayberry Sanatorium; Director of Laboratories, Mayberry Sanatorium; Medical Director, Herman Keifer Hospital; Director of Laboratories, Herman Keifer Hospital; and Professor, Public Health Statistics, University of Michigan, Ann Arbor, Michigan.

This study was performed under United States Public Health Service Grant RG-5005(C). Presented at the Twentieth Annual Meeting of the American Industrial Hygiene Association, Chicago, Illinois, April, 1959.

The advisory committee was of great assistance in planning various phases of this study. Being associated with the several departments of the city of Detroit and with other interested groups, this Committee extended our own knowledge and facilities related to this research project.

In conducting the actual field work, we had the assistance of several experienced industrial hygienists, regularly employed by the Detroit Bureau of Industrial Hygiene. Their services included collection of samples of carbon monoxide in air and operation of the continuous CO recorders, selection of the appropriate method for CO-hemoglobin determination and performance of the actual routine analyses.

The progress of this study was due to the excellent cooperation of several interested departments of the city of Detroit, without whose aid this study would have been impossible. These agencies include: (1) Detroit Department of Health a. Bureau of Industrial Hygiene, b. Receiving Hospital, c. Herman Kiefer Hospital; (2) Department of Police—Accident Prevention Bureau; (3) Bureau of Street and Traffic; (4) Public Lighting Commission; (5) Detroit Street Railway.

SAMPLING LOCATIONS

One of the preliminary steps of this study was to establish sampling stations at selected sites in Detroit which would be representative of the several different types of traffic conditions. The selection of the sampling sites was accomplished after much field testing, deliberation and conferences with various departments of the city of Detroit. Traffic patterns were carefully evaluated and preliminary surveys were made of carbon monoxide concentrations.

Central Business District (Downtown Detroit). The recorder located in the central business district was situated on a small triangular island approximately fifty feet on each side. All three sides of the island faced heavily trafficked streets.

Neighborhood Shopping Area. This sampling site was in a busy neighborhood shopping area in the northwest section of Detroit. The recorder at this station was placed on the southeast corner of the intersection and the inlet tube was approximately four feet above the street, at the curb line.

Depressed Highway. A sampler was located in the building of the R. L. Polk Company's garage which is adjacent to one of the city's depressed expressways. A 50-foot length of tygon tubing was extended from the instrument down into the expressway, the inlet of the tubing being approximately four feet above the ground at the curb line.

Residential Area. A recorder was placed in the garage of a home in a residential area in northwest Detroit. Tubing was extended from the instrument to a sampling point in the back-yard.

INSTRUMENTS AND ANALYSES

Determination of Carbon Monoxide in Air

Preliminary surveys of street level concentrations of carbon monoxide at several locations and at different times of day were made with carbon monoxide indicating tubes developed by Dr. Shepard of the National Bureau of Standards and manufactured by the Mine Safety Appliances Company. Up to 250 ml of air was drawn through the tubes with a 50-ml syringe, care being taken to keep the tubes at a temperature above 70°F and at the sampling rate of 50 ml in 30 seconds. Performance of the tubes was considered satisfactory for this purpose, and the values of carbon monoxide found were consistent with those obtained by other methods. On the basis of these results, and other factors, continuous recording equipment and sample sites were selected.

Two Lira Infra-red Gas Analyzers (Mine Safety Appliances Co., Pittsburgh, Pennsylvania) and one Model 105 Tri-non Infra-red Gas Analyzer (Perkin-Elmer Corp., Norwalk, Connecticut), calibrated for carbon monoxide, were used in this study. Their range was 0-100 ppm. Peak concentrations above 100 ppm were thus not recorded, however this limitation would not greatly influence the median values.

The recording instruments were operated continuously and serviced daily or two or three times weekly, as circumstances dictated. The Lira instrument proved to be more convenient, because it was not influenced appreciably by normal atmospheric water vapor. The Tri-non device required preliminary moisture removal (Drierite was used) from the sample stream.

Instruments were adjusted to zero at each service call with CO-free nitrogen from a compressed gas cylinder and calibrated with 75 ppm carbon monoxide-nitrogen mixtures in compressed gas cylinders (obtained from Mine Safety Appliances Company) or with known carbon monoxide-air mixtures in large plastic bags. Calibrations were made at intervals of one to four weeks depending on the stability of each instrument. All instruments were serviced by experienced industrial hygienists who made appropriate notations on the recording chart at the time of servicing concerning operating status of the recorder, unusual traffic or weather conditions, and other such items. Charts were usually removed monthly after a preliminary comparison of the performance of the instruments on site. Repeated calibration showed these instruments to be reliable to ± 1 part per million, with infrequent drifting somewhat beyond this value.

Carbon monoxide levels in the driver's breathing zone within passenger automobiles moving in traffic were obtained with a M.S.A. Type 45411 carbon monoxide indicator modified by us to give stable and reliable readings to ± 5 ppm in the zero to 100 ppm range. Attempts to adapt the recording infrared analyzers to service in a moving vehicle were unsuccessful. Independent spot checks with carbon monoxide indicating tubes agreed well with the continuously indicating analyzer used. Concentrations found ranged from zero to 100 ppm, depending upon traffic and wind conditions. While these concentrations were higher than those found at curb side sampling locations, the differences would not be of physiological significance.

Determination of Carbon Monoxide in Blood

All blood samples were collected in Becton and Dickinson 5-ml vacutainers using di-sodium ethylenediamine tetracetate as an anticoagulant. Tubes were allowed to fill as completely as possible with blood to minimize loss of carbon monoxide to the gas phase. Samples were analyzed within 12 hours to five days of collection. Experiments showed no loss of carbon monoxide during storage for this period of time.

Considerable trouble was experienced in finding methods for determination of carbon monoxide in blood which are accurate in the zero to 10 per cent hemoglobin saturation range. A search of the literature revealed 133 methods available for the purpose, which in itself indicates the difficulties involved in successful methodology. A direct spectrophotometric method, a gas volumetric method (Scholander and Roughton, *J. Ind. Hyg. and Tox. 24:* 218, 1942) and a micro palladium chloride method (Berka, *Acta Medica Schadinaviea CLII,* 485, 1955), were studied thoroughly. The method of Scholander and Roughton was found to be the most satisfactory for low blood saturation levels and was used to obtain the results reported in this study.

Wide variations in hemoglobin content of the blood of accident victims necessitated a hemoglobin determination in each case to obtain a reliable index of percentage carbon monoxide saturation. Hemoglobin determinations were made with a Hellige Haemometer Model 304, Sahli system.

Reliability of each of the analytical procedures was verified from time to time by analysis of blood of low, known carbon monoxide content. These standards were prepared by appropriately diluting carbon monoxide saturated blood with the same blood free of significant quantities of carbon monoxide. Control analyses made on the blood of persons with no carbon monoxide exposure, smokers and those exposed occupationally gave results consistent with expectations. Our experience with the Scholander and Roughton method in this investigation is in agreement with their reported accuracy of 0.2 per cent volume per cent of CO in blood (one per cent carbon monoxide hemoglobin).

DISCUSSION

Researchers have known that variations in carbon monoxide concentrations in the atmosphere near streets can be explained by changes in meteorological and traffic conditions. It has been recognized that, although traffic is the major variable, the meteorological variables of wind speed, wind direction, inversion and temperature must be considered because of their retentive and dispersive effects on gases. What has not been explicitly shown, however, is how each of the independent or explanatory variables is functionally related to the dependent variable; how important each independent variable is, and how well a postulated mathematical relationship explains the variation in carbon monoxide concentration in the atmosphere.

To answer these questions a statistical experiment was conducted in the city of Detroit. Three sample points, or stations, were selected as being representative of traffic conditions in the city—downtown Detroit, a neighborhood shopping area and a depressed highway. At each sample point, for a one month period, two traffic counters recorded the north and south-bound traffic. Concurrently a carbon monoxide recorder charted the carbon monoxide concentration in the atmosphere. The collected data together with the Weather Bureau's published hourly meteorological readings and the International Joint Commission Air Pollution Laboratory temperature inversion data comprised the observations which were subjected to statistical analysis.

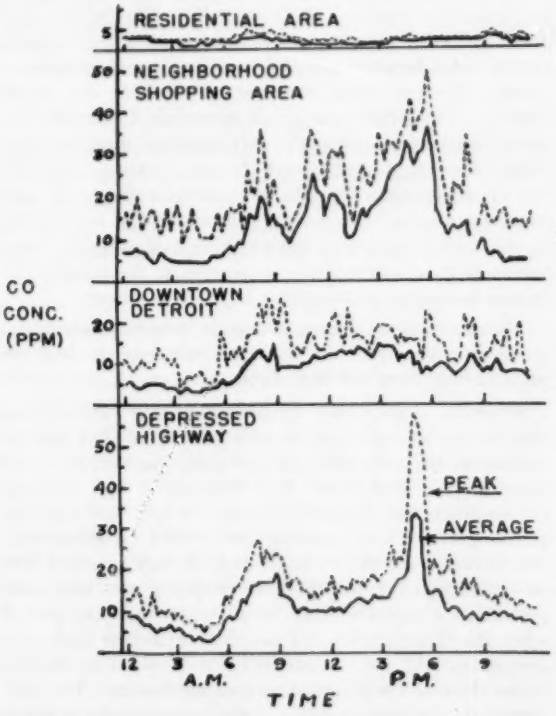


Figure 1. Carbon monoxide concentrations at each of four sampling sites during a typical day.

Statistical Analysis of Environmental Data

The daily median values obtained at the four sampling locations within the city of Detroit for a period of one year showed that at the downtown Detroit location the majority of the readings fluctuated between 5 and 15 ppm. The neighborhood shopping area showed a greater fluctuation with the majority of the observations at that location falling between 3 and 20 ppm. The majority of the observations at the depressed highway location ranged between 3 and 12 ppm. At the residential area location the majority of the observations fell between 0 and 4 ppm.

Figure No. 1 presents days selected at random to illustrate a typical day at each of the four sampling locations. This graph shows the 15 minute averages and the peak reading within the 15 minute period. It can be noted that at the depressed highway location the average values were highest in the morning and afternoon rush hours, with greater concentrations in the afternoon. This is most likely due to the location of the sampling instrument in relation to movement of the traffic rather than any difference in traffic or other conditions. The downtown Detroit location showed heavier concentrations throughout the business hours and no particularly sharp peaks. This is due to the fact that at this location there was no excessive traffic in the morning and afternoon, but rather a sustained traffic flow throughout the business day. The data at the neighborhood shopping area, like that at the depressed highway, shows peaks in the morning and afternoon with higher concentrations in the afternoon. This is again due to the location of the sampler in relation to the movement of traffic. Also, it is noted at this sampling station that there is a high peak around 11:00 a.m. This surge is probably due to shoppers' traffic. The residential area data were rather uninteresting and only during a period of inversion was a substantial increase in CO concentrations noted.

For the period of 21 weeks while the recorder was operating in downtown Detroit, the CO readings at that station ranged from 0-100 ppm, with a median of 9 ppm. During the 58 week period that a machine was located in the busy neighborhood shopping area, the data obtained showed CO readings ranging from 0-100 ppm with a median of 10 ppm. For the 27 weeks that a recorder was located on the depressed highway, the CO readings ranged from 0-100 ppm with a median of 8 ppm. The CO in

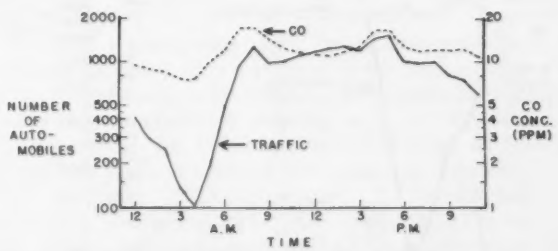


Figure 2. Comparison of the automobile traffic and the concentrations of carbon monoxide in the air at the downtown sampling site. The data show average values at different hours Monday through Friday one week in October, 1957.

the atmosphere of the residential area was sampled for a period of 18 weeks. The concentrations there ranged from 0-29 ppm with a median of only 2 ppm.

Preliminary to the more detailed statistical analysis, some suggestions regarding the hourly distribution of the variables were obtained from Figures 2 through 4.

Figures 2 and 3 describe the average hourly traffic and

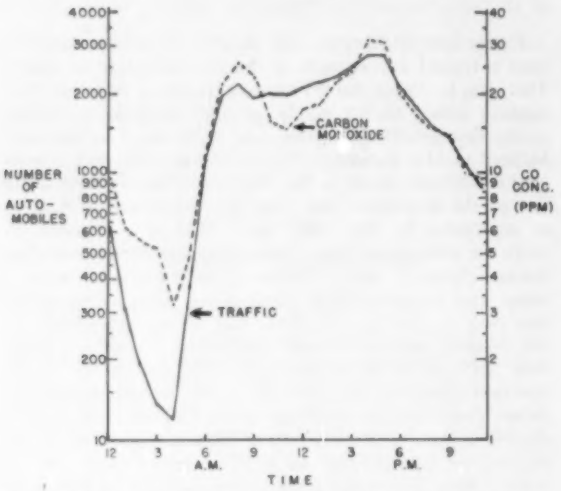


Figure 3. Comparison of average hourly concentrations of carbon monoxide and automobile traffic at neighborhood shopping area. Data are average daily values Monday through Friday in one week in October, 1957.

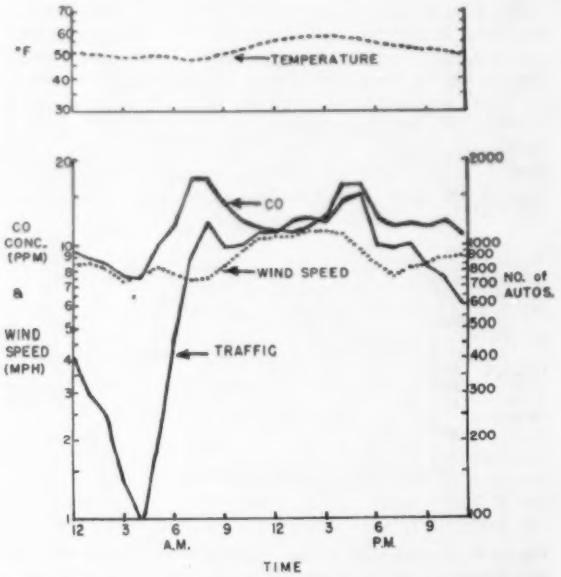


Figure 4. Comparison of average carbon monoxide concentration, wind speed, and temperature by hour of day.

carbon monoxide movements at the downtown Detroit and neighborhood shopping area sample points. For the former, the average hourly wind speed and temperature readings are shown in Figure 4. The graphs show: (1) High carbon monoxide readings occur during the hours when traffic density is heavy; low concentrations are found when traffic is light. This suggests a high correlation by hour of day between carbon monoxide and traffic. (2) Average hourly percentage changes in traffic densities do not necessarily imply equivalent changes in carbon monoxide concentration. This is most noticeable during the early hours of the morning. For these hours the percentage decline in traffic is much more severe than that of carbon monoxide. This result indicates that variables other than traffic must be considered. (3) Average wind speed is relatively low during the early hours of the morning. Average temperature, though also low during these hours, does not vary greatly by hour of the day. Since it is known *a priori* that inversion is highest during the early hours of the morning, the smaller decline in carbon monoxide concentration is explained by the favorable behavior of the meteorological variables (retentive effect). (4) A second significant finding from Figure 4 concerns the average movements of the variables for the hours 9 a.m. to 3 p.m. Although traffic is continually increasing during this period, the carbon monoxide concentration is mainly decreasing. Again the explanation can be traced to the meteorological variables. Average wind speed and temperature readings are at their highest levels and the inversion effect is small or nonexistent (dispersive effect). (5) There does not appear to be a significant time lag between traffic and carbon monoxide at either station. The two series, for most hours of the day, move together. (6) Traffic and carbon monoxide movements are more closely correlated at the neighborhood shopping area station than at the downtown Detroit location. For the former station therefore, the regression coefficient of the traffic variable in the regression function will be larger; that is, the traffic variable at the neighborhood shopping area station will explain a larger proportion of the variation in carbon monoxide concentration in the atmosphere.

The variations of carbon monoxide concentrations in the atmosphere by day of the week and month of the year are presented in Figure 5 and Table I.

Figure 5 shows: (1) Carbon monoxide variability is smallest during the hours of midnight-5 a.m. The relative stability of the meteorological and traffic variables for these hours explain this result. (2) Whereas a high weekday concentration was observed between 7-8 a.m. and 4-6 p.m. (traffic going to and returning from work) no similar pattern appeared for the weekend days. It may be noted that on Saturday at the neighborhood shopping area high concentrations occurred during the afternoon shopping period while the other stations did not show unusually high concentrations. All the stations except the residential area location showed lower concentrations on Sunday. The residential area location showed a slight increase in the morning hours with the exception of Sunday and Monday. This increase is probably due to temperature inversion effects.

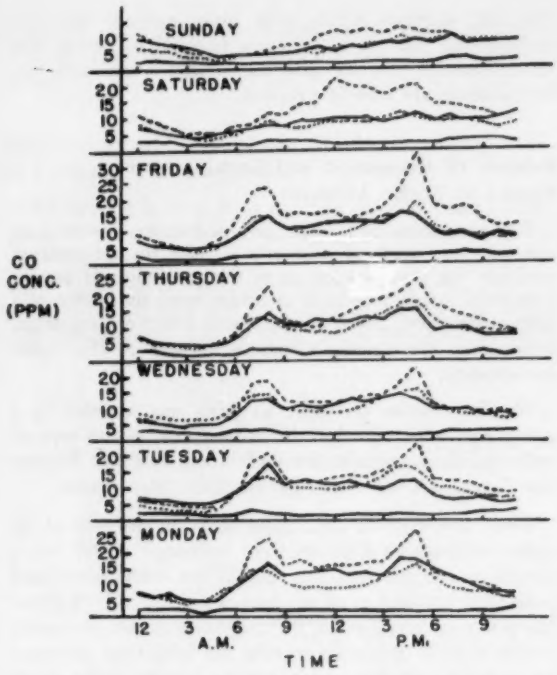


Figure 5. Hourly median carbon monoxide concentrations by day of week for the four sampling sites. Broken line (upper in all graphs) is for the neighborhood shopping area; dotted line is for the depressed highway; upper solid line is for the downtown area; and the lower solid line is for the residential area.

Table I shows the median CO concentrations by month at the four sampling locations. It may be noted that at the depressed highway location the readings ranged from 7-11 ppm, at the downtown location from 7-10 ppm, at the neighborhood shopping area from 6-17 ppm, and at the residential area location from 1-3 ppm. The results at the three business locations are surprisingly uniform. It may be noted that the concentrations increased during September and October. This is undoubtedly due to the temperature inversion which prevails in this area at that time of the year.

Figure 6 shows a comparison of average traffic conditions and average CO concentrations during periods of inversion and no inversion at the downtown Detroit sampling location. It may be noted that except for the hours 10:00 a.m. to 4:00 p.m., when inversion does not usually occur, the average hourly CO concentrations in the atmosphere are significantly higher during periods of temperature inversion. Note, however, the similarity of hourly traffic movements for the two time-series. A one way analysis of variance test of the downtown Detroit data (inversion vs. no inversion) proved to be significant.

Figure 7 shows a comparison of average traffic conditions and CO concentrations during periods of low and medium wind speed at the downtown Detroit location. It is interesting to note that whereas the traffic movements are very

TABLE I
Median CO Concentrations by Month at the Various Sampling Locations

Month	Depressed highway	Downtown Detroit	Neighborhood shopping area	Residential area
August, 1957	—	—	—	—
September, 1957	11 ppm	—	—	—
October, 1957	10 ppm	10 ppm	13 ppm	—
November, 1957	8 ppm	9 ppm	6 ppm	—
December, 1957	7 ppm	9 ppm	9 ppm	—
January, 1958	8 ppm	7 ppm	9 ppm	—
February, 1958	7 ppm	8 ppm	6 ppm	—
March, 1958	—	—	9.5 ppm	1 ppm
April, 1958	—	—	10.5 ppm	2 ppm
May, 1958	—	—	—	2 ppm
June, 1958	—	—	—	2 ppm
July, 1958	—	—	—	3 ppm
August, 1958	—	—	—	—
September, 1958	—	—	17 ppm	—
October, 1958	—	—	16 ppm	—
November, 1958	—	—	10.5 ppm	—

similar for the two time-series, the average hourly CO concentration is always higher for the low wind speed data.

Mathematical Model

An important phase of this investigation was an effort to utilize the atmospheric data obtained to formulate a mathematical expression which would predict under what conditions excessively high CO concentrations could accumulate in the Detroit area and thus be instrumental in producing an air pollution disaster.

We were interested in knowing if it would be possible to determine if there should be a limit as to the number of cars traveling Detroit highways; what meteorological conditions would have to prevail to have an excessive accumulation of CO in the atmosphere and what the other sources of CO in a community contribute to pollution.

As a first approximation to the "true" relationship between the variables, there was fitted to the weekday data by classical least squares the following mathematical model. Assume for neighborhood shopping area and depressed highway stations that carbon monoxide (X_1) can be expressed as a linear function of some known or fixed variables: wind speed (X_2), temperature (X_3), northbound traffic (X_4), southbound traffic (X_5), inversion (X_6), and time of the day (X_7), with residual errors which are normally and independently distributed with mean zero and constant variance (for downtown Detroit northbound and southbound traffic are combined and the time variable omitted).

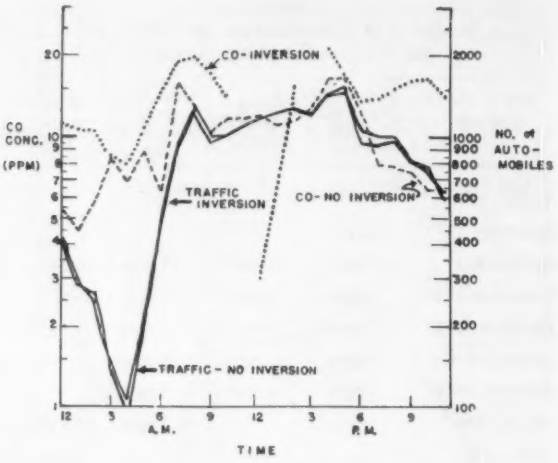


Figure 6. Comparison of average traffic conditions and carbon monoxide concentrations during periods of inversion and no inversion.

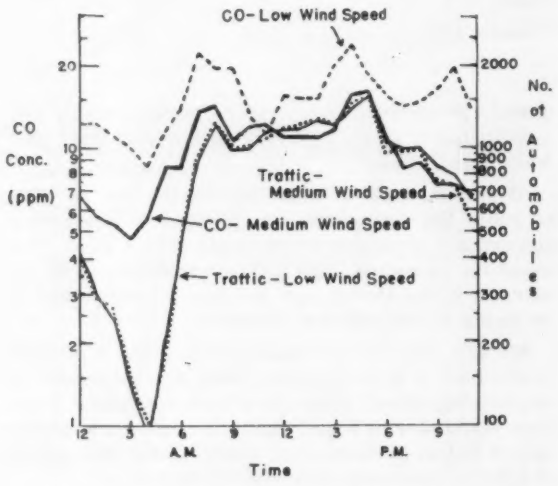


Figure 7. Comparison of average traffic conditions and carbon monoxide concentrations during periods of low and medium wind speed.

Algebraically the model is

$$X_1 j = B_2 X_{2j} + B_3 X_{3j} + B_4 X_{4j} + B_5 X_{5j} + B_6 X_{6j} + B_7 X_{7j} + e_j$$

where

$$j = 1, 2, \ldots, n.$$

The first attempts which were made indicate that this mathematical procedure, although essential to obtain first approximations, did not give the desired results and further analyses are now in progress.

Relation of Occupation and Certain Other Factors to Traffic Accidents

The occupation of drivers and pedestrians involved in accidents was obtained primarily to have the information available for investigation as to the possibility of an occupational carbon monoxide exposure being the source of a high carboxyhemoglobin of an injured driver or pedestrian, rather than the carbon monoxide present in the traffic environment.

The information on traffic accidents was recorded by a group especially trained in the investigation of this type of traffic accidents, namely, the staff of the Accident Prevention Bureau (APB) of the Detroit Police Department.

These officers, who investigate some 40 per cent of all traffic accidents in Detroit, were instructed to fill out a special report form of our design for each driver and pedestrian involved in all accidents which they investigated. Exceptions occurred where the exigencies of the emergency caused it to be infeasible to take the brief time necessary for recording the data and where the severity of the injury did not permit eliciting information on certain of the items. Extensive tables have been prepared showing accident frequency by occupation. Space does not permit presenting all these data.

Classifications established by the United States Department of Commerce, Bureau of Census, in their *Bulletin P-C22, 1950 U. S. Census of Population* were used to designate occupational groups. For the various classification groups, the percentage of accidents attributed to each group was found in comparison to the percentage of the population represented by that group to be:

Professional, technical, etc.	slightly higher
Managers, officials, proprietors	slightly lower
Clerical, etc.	appreciably lower
Farmers, farm laborers, and farm managers	appreciably lower
Laborers	decidedly higher
Operators, etc.	lower
Craftsmen, foremen, etc.	higher
Service workers, salesmen, private householders	lower

The data are based on 4,052 consecutive accident reports prepared specifically for our purposes and includes 4,996 persons involved in these accidents occurring over the period February 7 to April 30, 1957. Those occupations where high CO exposures would be expected did not have,

with few exceptions, high accident rates. It was concluded that occupational CO exposures did not influence driving ability.

Relationship of Atmospheric CO Inside a Car to Per cent CO Hemoglobin

An attempt was made to correlate per cent carbon monoxide in the blood to carbon monoxide concentrations in air. The work involved travel in a police scout car for about eight hours over a distance of 130 miles. Data on the concentration of CO in the air in the car was monitored continuously with an MSA carbon monoxide detector.

TABLE II

Frequency Distribution of CO Blood Analyses

Blood saturation in per cent of CA-hemoglobin	Total number of analyses	Status of individuals involved			
		Drivers	Pedestrians	Passengers	Unknowns
Less than 1.0.....	73	27	30	5	11
1.0– 1.9.....	45	21	17	1	6
2.0– 2.9.....	30	14	11	1	4
3.0– 3.9.....	14	6	6	—	2
4.0– 4.9.....	25	12	6	3	4
5.0– 5.9.....	14	6	7	—	1
6.0– 6.9.....	10	3	4	1	2
7.0– 7.9.....	7	5	2	—	—
8.0– 8.9.....	4	3	1	—	—
9.0– 9.9.....	2	2	—	—	—
10.0–10.9.....	1	—	—	—	1
11.0–11.9.....	1	1	—	—	—
31.5.....	1	—	—	—	1
Clotted	7	2	3	1	1
Broken	3	1	2	—	—
Totals.....	237	103	89	12	33

and intermittently with NBS carbon monoxide indicator tubes. Readings of the CO concentration were taken and recorded at five minute intervals. Carbon monoxide levels in blood were recorded at two hour intervals. Included was one participant who smoked cigars and another who was a non-smoker. There was a continuous flow of air into the vehicle so that CO in the air reflected outside traffic conditions at all times, and was not influenced by any tobacco smoke within the vehicle.

Fifty readings taken with the MSA detector showed an average CO value of 17 ppm. The peak value of 120 ppm was attained when the vehicle was not moving, but the engine was idling.

Nine CO blood values were determined. A slight rise in the CO content of the blood was evidenced: 0.8 to 1.2 per cent CO-hemoglobin for the non-smoker, and 3.1 to 3.9 per cent CO-hemoglobin for the smoker. The smoking rate for the latter was essentially the same throughout the sampling day.

Carbon Monoxide in Blood Values for Accident Victims

Arrangements were made with the city of Detroit, Department of Health, Receiving Hospital to obtain a blood sample from the drivers of automobiles and pedestrians involved in accidents and brought to the hospital for treatment. A case history was prepared for each sample received, whenever possible. This case history contained such information as: name, driver or pedestrian, were glasses worn, accident occurred on way from job, occupation, number of hours driving prior to accident, degree of smoking, traffic conditions, general condition of vehicle, condition of exhaust pipe and muffler, location of accident, date, day of week, time of day, vehicle make and year, location of air inlet, whether person had been drinking, was their ability to drive impaired, time blood sample was taken, date analyses were performed, and results of blood analyses.

Table II presents the blood saturation in percentage of CO-hemoglobin. Of the 237 samples analyzed, 50 per cent were below 2.0 per cent saturation. A comparison of the drivers' percentage of saturation to the pedestrians' percentage of saturation shows that 50 per cent of the drivers had less than 3.0 per cent saturation, whereas 50 per cent of the pedestrians had less than 2.0 per cent saturation. The last column shown as "unknowns" refers to those samples where it was not possible to obtain information as to whether the person involved was a driver or a pedestrian.

A comparison of the number of drivers to the number of pedestrians in the various percentage classifications show a slightly higher number of drivers with the higher percentage saturation than pedestrians, however the numbers are not sufficiently large to warrant any conclusion.

Although more work needs to be done on the carboxy hemoglobin saturation required to affect sensory-motor performance, the opinion is generally held, and the authors concur, that any CO-hemoglobin saturation less than 10 per cent will not cause any disturbance in driving ability. Considering that only three persons out of the 237 were in excess of this figure, it must be concluded that the CO concentrations in the general atmosphere of an urban area such as Detroit is not a factor in impairing driving ability.

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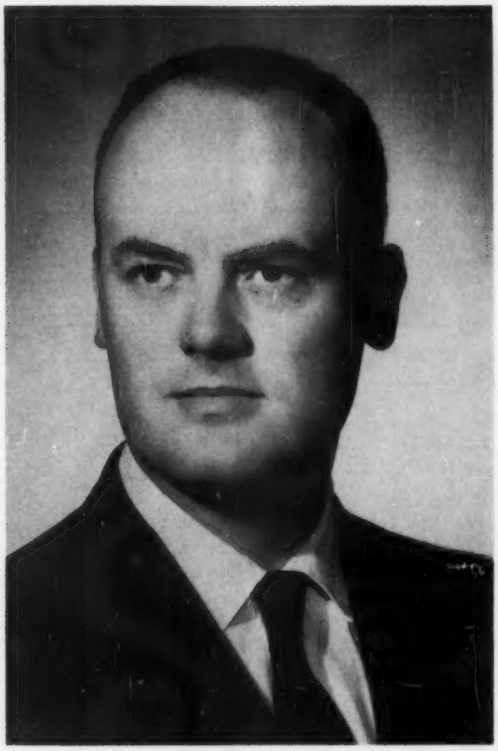
2. AAGE GRUT, *Chronic CO Poisoning*, (Copenhagen: Ejner Munksgard, 1949) (includes 180 references).

METROPOLITAN LIFE AWARD



The National Safety Council announces with great pleasure the selection of Doctor B. J. Campbell as the recipient of the Metropolitan Life Award for Research in Accident Prevention. Doctor Campbell, who is presently Assistant to the Director of the Automotive Crash Injury Research Project at Cornell University, Ithaca, New York, received the Metropolitan Life Award for his work entitled *Driver Improvement Through The Point System.*

Doctor Campbell's study was part of a research project carried out by the Institute of Government, University of North Carolina, for the American Association of Motor Vehicle Administrators. The project was made possible by a grant from the Esso Safety Foundation. The completed report of the project is entitled *Driver Improvement: The Point System.*

Doctor Campbell was presented with a plaque and a check for $1,000 by Mr. Frederick W. Ecker, Chairman of the Board of the Metropolitan Life Insurance Company at the American Life Convention which was held in Chicago on October 13, 1960.

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POSITION.....

COMPANY.....

ADDRESS.....

CITY & STATE.....

2

DECEMBER, 1960
(good until March 31, 1961)

PRODUCTS ADVERTISED

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

NEW SAFETY EQUIPMENT

41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

SAFETY PRODUCT LITERATURE

81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

NAME.....

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The advertising pages of Traffic Safety

. . . your guide to products of importance to your safety program

Keep up-to-the minute on all the latest advances in traffic and transportation safety products and services through the advertising pages and new equipment editorial features in Traffic Safety.

Should you want additional information or special consultation on your specific problems, don't hesitate to write to the manufacturers. They welcome your inquiries and will answer your questions without obligation.

Although the Council does not test or examine the products advertised or mentioned in the editorial features, staff engineers and technicians review all product information in an effort to determine that descriptions and performance claims are accurate. It should not be construed, however, that commercial products are approved or endorsed by the National Safety Council.

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Before you mail your Reader Service Postcard . . .

TAKE ANOTHER LOOK AT

- the ADVERTISING pages
- the NEW SAFETY EQUIPMENT section
- the SAFETY PRODUCT LITERATURE section

Make sure that all the items you want to know about are circled . . . check to make sure that your name, organization and address are printed on the reverse side of the postcard . . . THEN mail it today.

Save Lost Truck-Days with WEED V-BAR TIRE CHAINS

Stuck trucks cost you money in unproductive overhead, broken schedules, and disappointed customers. When the going gets tough, keep your vehicles rolling on WEED V-BAR TIRE CHAINS. Weed Chains stop shorter and safer on snow or ice... provide the traction your trucks need to keep moving—avoid traffic tie-ups and lost time.

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ACCO

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

York, Pa., Boston, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.
In Canada: **DOMINION CHAIN COMPANY, LTD.,** Niagara Falls, Ontario

Check your tire chains now. Make necessary repairs early. Order new chains from your Weed Chain distributor

Circle Item No. 10—Reader Service Card

NEW! High Visibility Traffic Buttons Work to Protect Life...

Even in the rain!

Cast from impact-resistant Thiokol polysulfide-base material. Easy to install. Stay put for years. Add highway safety . . . night and day, fair weather and foul.

New THIO-LINE Traffic Buttons, composed of high visibility reflector glass beads embedded in durable THIOKOL liquid polysulfide polymer base material, have a raised dimension—insuring effectiveness even in weather which blanks out conventional markers.

Easy to install—THIO-LINE buttons are bonded in place in 10-60 minutes (depending on the temperature) over asphalt, concrete or brick by THIO-LINE liquid polymer-base adhesive with a grip like steel.

Long-lived—in six years of testing on busy California thorofares, 25,000 buttons of the THIO-LINE type have averaged 99.9% durability record. Life expectancy of THIO-LINE: 10 to 15 years on city streets compared to 2 months for paint and 6 months for plastic markers. 25 years on the open highway contrasted to 12 months for paint and 2 to 3 years for plastic.

Thiokol®
CHEMICAL CORPORATION
780 NORTH CLINTON AVENUE
TRENTON 7, NEW JERSEY
In Canada: Naugatuck Chemicals Division, Dominion Rubber Co., Elmira, Ontario

*Registered trademark of the Thiokol Chemical Corporation for its liquid polymers, rocket propellants, plasticizers, and other chemical products

THIOKOL CHEMICAL CORPORATION, Dept. TM-92
780 N. Clinton Avenue, Trenton 7, New Jersey
Gentlemen: Please send me your technical bulletin describing characteristics and installation procedures on THIO-LINE TRAFFIC BUTTONS, and a list of distributors.

NAME _____ POSITION _____

FIRM _____ STREET _____

CITY _____ ZONE _____ STATE _____

Circle Item No. 11—Reader Service Card